

THE IRON AGE

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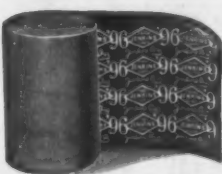
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THE IRON AGE

New York, Thursday, April 4, 1907.

Special Handling Appliances for the Shop.

The Truck and Crane Systems of the B. F. Sturtevant Company, Hyde Park, Mass.

BY H. M. LANE.

The handling of work through the shop in a way that shall prevent congestion at any point and at the same time keep down handling expense to a minimum is a problem which must be solved in every manufacturing establishment. Where there is work enough to warrant it, a special truck is often a money saving device. In some shops it is the rule never to pile work on the floor, but always to keep it on some wheeled truck, so that it may be readily shifted from one place to another. Of course there are always exceptions to this rule. The application of the truck system to one style manufacturing is well illustrated by the practice worked out at the plant of the B. F. Sturtevant Company, at Hyde Park, Mass. Some of the trucks used for special purposes in this shop are shown in Fig. 1—a varied collection, certain-

chains or by pushing the pipe itself. Full lengths of pipe are passed directly to the cutting off machines, where by means of suitable stops they are cut to the proper lengths.

The sections of pipe when cut are never laid on the floor, but immediately placed on special trucks, some of these being shown in Fig. 3. For the first operation the pipes are simply cut to length and stacked on the trucks. The latter are made of such a width that they hold a given number of pieces of pipe across the body, and the stock is cut in such proportion as to fill the truck.

The next operation is threading. Each piece is passed from the first truck to the threading machine and then immediately loaded on another truck. This is then run to the place where elbows are attached as required. This done, the pipe is placed on another style of trucks, shown



Fig. 1.—Group of Trucks and Other Handling Appliances Used in the Works of the B. F. Sturtevant Company.

ly, but such a grouping tells the story of the engineer's effort to design each truck to meet some special requirement. It will be noticed that the ordinary standard baggage truck has a place in the system, as has also the standard coke charging barrow. The latter is found exceedingly handy for transporting small scrap in the shape of punchings.

In studying the handling appliances as worked out in the Sturtevant shop it may be well to start at one section and follow the work through.

Handling Devices for Pipe.

One of the principal lines manufactured by this company is heaters, which are made up largely of pipe. For transporting the pipe from the storage sheds in the yard to the cutting off room a telfer or overhead trolley system is employed. This is equipped with an electric hoist, as shown in Fig. 2, and the hoist is equipped with a special hook carriage consisting of three parallel hooks suitable for supporting pipe. Travel along the trolley rail is effected by the workmen pulling by means of the

in Fig. 4. It is to be noted that the first style of truck handles the work in masses, while the second separates the different lengths and also to a certain extent protects the threads from injury. Another advantage of the truck in Fig. 4 is that the divisions are so arranged that the workman can tell at a glance when he has completed the number of pieces required to fill a given order. The pieces necessary for one or more heaters being assembled on one of these trucks, it is pushed to the assembling floor, where the work is put together.

The Use of Large Wheels.

A first principle in truck construction is to make the wheels for carrying the load of as large diameter as conditions will permit, since the larger the wheel the easier it will mount or pass over obstructions. A study of the trucks shown particularly in Figs. 3 and 4 will show that this principle has been followed out as far as circumstances would permit, the small casters on the end serving merely as supports and being arranged with universal swivel, so as to allow the truck to turn in its own length.

This is an important point in truck design and one often neglected.

An exception to the large wheel idea is the small triangular truck in the foreground of Fig. 3, carrying a keg

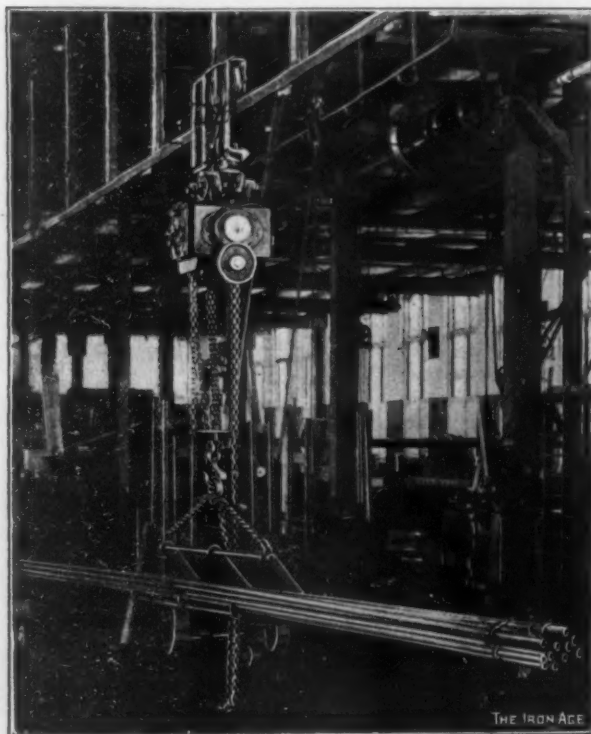


Fig. 2.—Telpher System Equipped with Electric Hoist and Special Carrier for Pipe.

of fittings. This truck will be found exceedingly handy for transporting a keg or small steel barrel of fittings from place to place on the erecting floor. It is supported on three casters, each fitted with a universal joint, so it can be shifted or shoved in any direction. Such a truck is



Fig. 3.—Trucks for Handling Pipe and Fittings in the Heater Department.

not fitted for long distance transportation, but simply as a handy means of keeping the small parts near the erector or fitter, and hence the use of the small wheels is not so objectionable.

Another example of a truck which violates the large wheel principle is shown in Fig. 5. All engineers know

that for the moving of heavy parts rollers have certain decided advantages, as they permit of the work being shifted at a low level. When rollers are ordinarily used it is necessary to place a plank under the work and constantly to shift the roller forward. The truck in Fig. 5, which has been adapted from the builder's timber truck, obviates a number of these difficulties by providing a single roller, which accompanies the piece being moved. The piece shown is the base for a heater section, and the truck shifts such pieces from the storage piles to the machines at which they are drilled and tapped. Being supported on a single roller this truck can be twisted and turned and pushed in any direction.

After the heater sections have been completed and



Fig. 4.—Special Pipe Truck with Divisions for Separating Different Lengths and Assembling All the Pipe for One Job.

boxed they form large, awkward pieces which are rather difficult to handle. Most of them are handled by a special overhead traveling crane, and transferred to car loading jib cranes outside the building. For transporting such as go to a distant part of the building a special two-wheel truck with wheels of large diameter is used. It is shown with a section on it in Fig. 6. This truck is inexpensive in construction, and very efficient for the purpose for which it was designed.

Trucks for Fan Materials.

In the fan department a radically different set of conditions is met. Here the material employed in fans, hous-

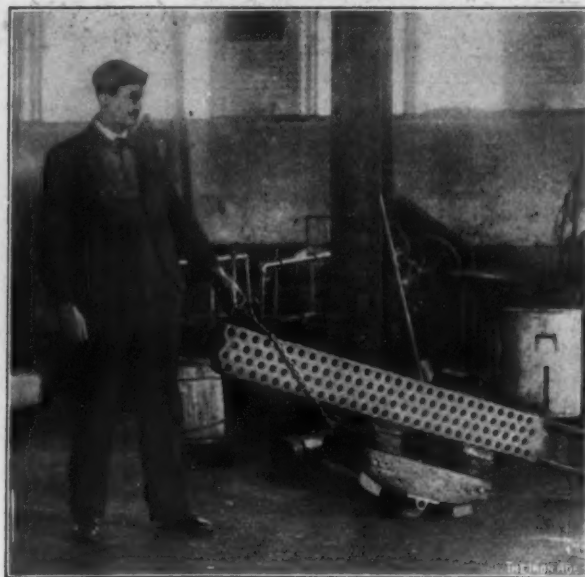


Fig. 5.—Small Single Roller Truck for Handling Heater Bases.

ings, &c., is first received in the form of large plates, some of which have considerable weight. The runways in this

department are largely covered with iron plates, so that small wheeled trucks can be used to advantage. For transporting sheets or plates to the various machines a small two-wheeled truck is provided, shown in use in Fig. 7. It consists of a pair of cast iron wheels, connected

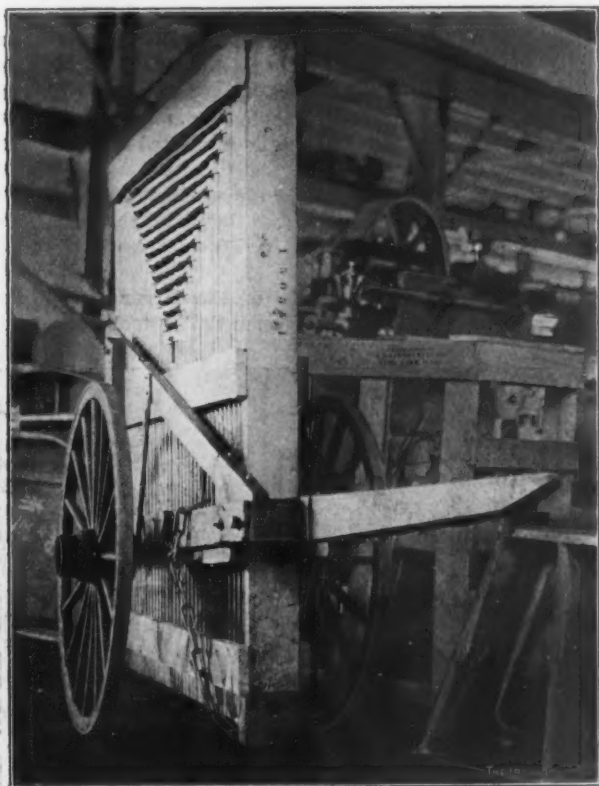


Fig. 6.—Special Two-Wheeled Truck for Handling Heater Sections After Crating.

with a yoke upon which the plate is supported on edge. With this device two or three men can move the largest plates required in the department.

The angles, castings, &c., are transported on flat top or rack trucks, similar to those used in the pipe depart-

ment, which is a slow and dangerous operation. With a truck, however, a spider can be taken from place to place easily and rapidly. The design is such that the spider can be simply rolled upon the truck, one of the arms sliding over the pipe support, which acts as a fulcrum, while the man loads the spider by lifting on the ends of the opposite arms.

For transporting finished fans, the truck in use in Fig.

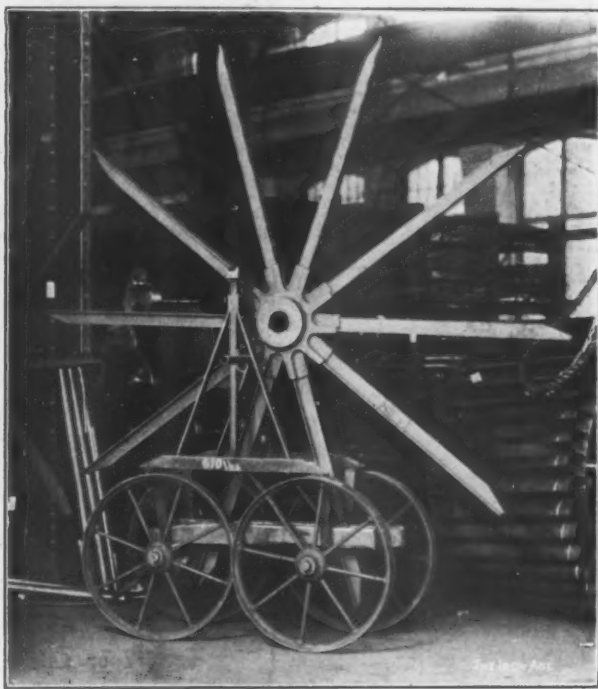


Fig. 8.—Special Truck for Fan Spiders.

9 has been designed. Several styles of this general type are used, two being shown in Fig. 1. One of the principal advantages of this truck is that a man can load a very heavy piece himself. If he can get the nose of the truck under the feet of a fan he can pry the feet up several inches from the floor and then drop the truck



Fig. 7.—Two-Wheeled Truck for Handling Plates.

ment, some of which are shown in Fig. 1. For the finished product a number of special trucks have been designed. One of these, shown in Fig. 8, is employed in transporting fan spiders. When the truck is not used it is necessary for a man to roll the spider upon its arms,

very quickly and shove it forward a few inches. By repeating this operation he can jump a large fan upon the truck in a few seconds. In this way one man can load, transport and unload such product with great ease. The truck, of course, violates the large wheel principle, but

In this case the easy loading and the fact that the work transported is light compared with its bulk, justify the small wheels.

The trucks and handling appliances thus far shown



Fig. 9.—Special Type Low Wheeled Truck with Sharp Edge to Facilitate Loading.

have all been intended for handling work or finished product from one department or machine to another, or in other words, for handling the material while not being operated upon. For handling large, irregular pieces,

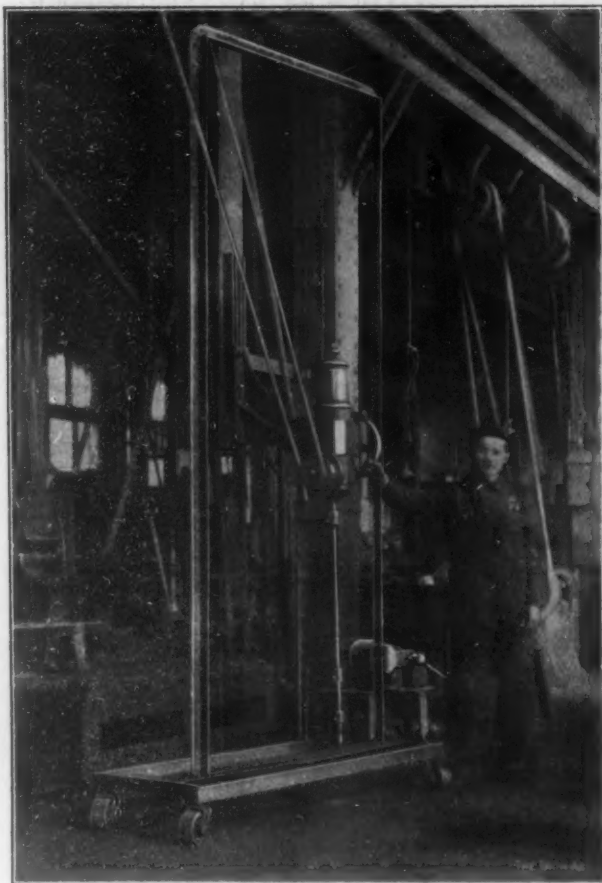


Fig. 10.—Combined Steel Truck and Work Table for Holding Pieces for Machinery.—Vise Mounted on End of Truck.

such as angle iron frames, for drilling or special operations, the truck in Fig. 10 has been designed. It will be noted that at one end is placed a vise of the swivel type.

Besides being used as shown in Fig. 10, this truck would be found exceedingly handy on the erecting floor in some cases.

Devices for Serving Machines.

Much careful thought has been given to the handling of work while being operated upon, and some of the devices shown have proved exceedingly efficient. For supporting plates at the punches a small jib crane of the type shown in Fig. 11 has been developed. This consists of a piece of ordinary gas pipe mounted on top of the punch, and carried at the top by a suitable socket bolted to the ceiling. The jib is supported at the outer end by a diagonal tie rod. The illustration shows the construction of the trolley and the method of trussing or bracing the upright or mast. A large number of these jibs are in constant use and have given excellent satisfaction.

For serving machine tools of the larger type it is important to have appliances such that a tool will at no

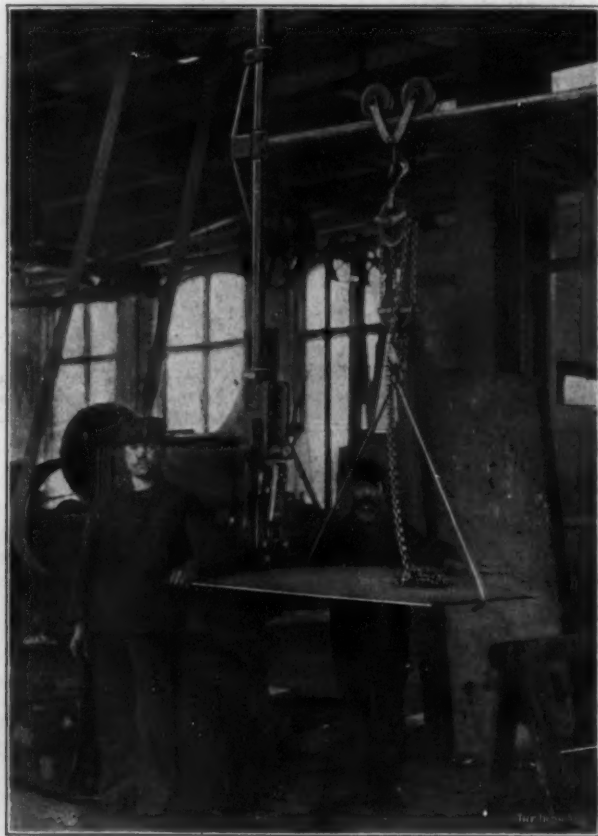


Fig. 11.—Gas Pipe Jib Crane Mounted Over a Punch.

time have to stand idle, waiting for the carrier which serves its section. In most cases the work on two or three of the larger types of tools can be so arranged that a single handling appliance will serve them, the work being brought to the floor adjacent to the tools on trucks or on cars on the industrial railway, and the finished product removed in the same manner. Fig. 12 shows a traveling crane on a circular track, intended to serve three large lathes. A sufficient amount of work can be kept piled on the floor adjacent to the lathes to keep them in constant operation. The radial traveler is provided with a direct current electric hoist, and the outer end traversed by a mechanism operated by a hand chain. The particular device shown has proved itself efficient in this instance, but the way in which local conditions have to govern circumstances is well illustrated in this shop. In the background in Fig. 12 is a small jib crane made of large sized pipe, with a flat iron jib, supported by truss rods and used for serving a single machine.

All interested in mechanical appliances are familiar with the ordinary means of handling work on the erecting floors. In the shop under consideration many sheets and angles must be suspended in the air until they can be bolted or riveted in place. To provide for this two

light cantilever cranes have been arranged as bracket cranes to travel under a regular 5-ton traveling crane, as in Fig. 13. Each of these cranes is provided with an electric hoist on the cantilever or transverse traveler, but the longitudinal traverse is by hand. One object in this is that the cranes being light in structure are so arranged that if they are in the way of the main traveling crane it can simply sweep them before it to one end of the shop. If some rigid means of traverse had been adopted, it might result at some time in a wreck of one of the cantilever cranes by the traveling crane.

In Fig. 14 is illustrated a series of small traveling cranes, mounted over lathes and provided with hand operated chain hoists. Each of these cranes has a longitudinal travel equal to the distance between the headstocks of two lathes which are placed right and left on the opposite sides of the aisle. The transverse travel along the I-beam is, of course, sufficient to enable the trolley

material dumped. This method is capable of elaboration to suit various classes of manufacture. In some cases it would undoubtedly be advantageous to support the box by a bale connecting with trunnions on the sides of the box, so that it would dump easier. Stock of the character stored in these bins is usually drawn a few pieces at a time, to suit different orders.

For loading finished material on trucks or wagons the overhead trolley shown in Fig. 16 is used. This travels out through one of the doors and serves either for unloading trucks or loading material on trucks. A general principle in transportation work is so to arrange the handling appliances which pass from the inside to the outside of the buildings that a minimum amount of cold air will be admitted when work is being carried on out of doors. This trolley fulfills this requirement very nicely on account of the small opening necessary for the trolley itself to pass through the transom portion of the door,



Fig. 12.—Circular Traveler for Serving Three Lathes.

to pass over both lathes. The work is brought down through the aisle, either back of or between the lathes, on trucks, taken up by the chain hoists and placed in the machines. The use of individual handling appliances of this kind over machine tools reduces the helper work, or old fashioned lubber lifting system, to a minimum, and greatly increases the output of the machine, as the workman never has to wait for some one to help him change work. In many cases where two or more lathes of this kind are served by one handling appliance they can be operated by the same man, especially where long cuts are required.

Other Trolley Service.

For passing small work into stock bins a handy device, shown in Fig. 15, has been provided. The lipped box, which is suspended from a trolley, can be taken to any machine, filled with work and then brought to the front of the bins on a truck. The chain hoist serves to raise the box to the front of the bin where the material is to be stored; the lip is shoved into the bin and the mate-

and the provision of small swinging doors which automatically close after the trolley has passed through.

For storing and handling the material in the yards proper an industrial railroad system has been installed, and for piling up bulky material, such as economizer or heater sections, foundry flasks and the like, ordinary derricks of the boom type are used. These are operated by electrically driven drums located in a suitable house, which protects them from the weather, and are controlled by a whistle signal. The boom derricks have been found very efficient for handling certain classes of work and are much cheaper to install than a traveling crane system. The ordinary industrial railroad system does not vary greatly from that installed in many similar plants, and hence does not need special attention in this article, as the turntables and other devices have been illustrated heretofore in the technical press.

A noninflammable celluloid is said to have been patented in Italy by a British inventor. It is expected to be

a keen competitor of tortoise shell, the working of which has long been largely a monopoly of Naples, Italy. The new invention, it is claimed, at most will merely carbonize, and unlike celluloid it will not flow when heated, like a stream of melting sealing wax, setting fire to combustible substances it encounters.

Central American Notes.

SAN JUAN, CENTRAL AMERICA, March 7, 1907.—News from Valparaiso and all the Chilean coast recently devastated by the earthquake shows that the people are working hard to reconstruct their dwellings, public buildings, wharves and custom houses. Several cargoes of iron and steel structural material have arrived, and corrugated iron is much in use, as it is in other places in the earthquake zone. Business in general seems as brisk as ever; the copper output will be greater than last year; all the mines near Chanarcillo are increasing their production, and four new plants have arrived from England

States. Not only do we lose the sale of these goods, but it is working havoc with our reputation for first-class products.

There has been considerable brawling between Honduras, Nicaragua and Salvador, over the question of limits principally, which has led to some bloodshed. The work on the Eastern Coast Railroad has meanwhile stopped, and many interested in schemes in Nicaragua are holding off till things clear up a bit.

Guatemala is trying to get back to a business basis again. A survey is being made for a railroad in the northwest section of the coffee country, and several new steel bridges have been ordered for the Vera Paz District. The precautions taken on the east coast will probably prevent another outbreak of yellow fever this season.

The Tehuantepec Railroad in Mexico is doing much to develop that region between the two oceans. Both Salina Cruz and Coatzacoalcos are getting new wharves and steel and iron buildings for the custom house, storage houses and business establishments. Something is also being



Fig. 13.—Single I-Beam Traveling Cranes Serving Two Lathes Each.

and the United States. An American cyanide plant is also being put up in the same gold, silver and copper region. The gold mining industry in Tierra del Fuego and on the mainland is steadily improving, and quartz mills and other machinery have been ordered from the United States.

Argentina is a little at odds with Brazil because of the belief that the latter favors the United States too much in its commercial treaties. There is a large proportion of Italians in Argentina, and they lean toward European products and ways. If we can afford to treat Brazilian products (coffee, sugar, &c.) in a liberal way, there is surely an immense reciprocal market open to our goods in Rio de Janeiro, Sao Paulo, Bahia, Santos, Rio Grande and a number of other important places.

Too much attention cannot be paid to the matter of protecting our trademarks in all these countries. Our representatives should be instructed to negotiate special treaties for this purpose. There is scarcely an article from an ax to an engine or other machine that is not partly or totally counterfeited. The worst offenders seem to be the Belgians and Germans. They often go so far as to imitate the very trademarks we use in the United

States. Much business is expected in freight from the United States, going both eastward and westward between New York, New Orleans and Galveston in the east and San Francisco, Seattle and San Diego in the west. A number of western mines are figuring on sending their products eastward over this route.

C.

Government Rights in Swedish Iron Mines.—The agitation in Sweden over Government limitation of exports of iron ore has resulted in the presentation by the Crown to the Swedish Parliament of a proposition that the State acquire an interest in three of the largest iron ore deposits in the Kingdom, situated in Lapland and now controlled by private companies. The cablegrams do not name the mines, but presumably they are the Gellivaare, the Kirunaavaara and the Luossavaara in Lapland. The plan provides for the acquisition of a one-third interest by the State in these mines for 25 years, with the option to acquire another third after 30 years. In return the Government permits the mines to export ore without any restrictions as to quantity. Heretofore the limitations on exports have been such that the own-

ers have claimed no profit could be made, and German buyers of Swedish ores were much hampered.

Electric Ship Control.

That the helmsman may have direct control of the operation of the propellers of his ship an ingenious design has been perfected and put into service in Europe, in which electric motors are utilized as the direct driving agent. The propeller shaft carries the motor, while the crank shaft carries the generator and the prime mover, which, on account of its economical features, is a Diesel engine. The two shafts are in alignment with each other, and a magnetic clutch is provided, so that when the propeller has been brought up to full speed it may be driven directly by the engine, thus doing away with the losses inseparable from the operation through the two electrical units. It is, of course, while the generator and motor are in operation that the helmsman has a chance to exercise direct control for maneuvering purposes. This cannot be

the electric motors only. This scheme would lack the maximum ultimate efficiency features of the other one, but it would be preferable under certain conditions, where convenience might dictate a central location of the prime movers.

Among about a dozen American and Canadian cities New York stands at the head for immunity from typhoid, the figures covering a number of years. Since 1890 the

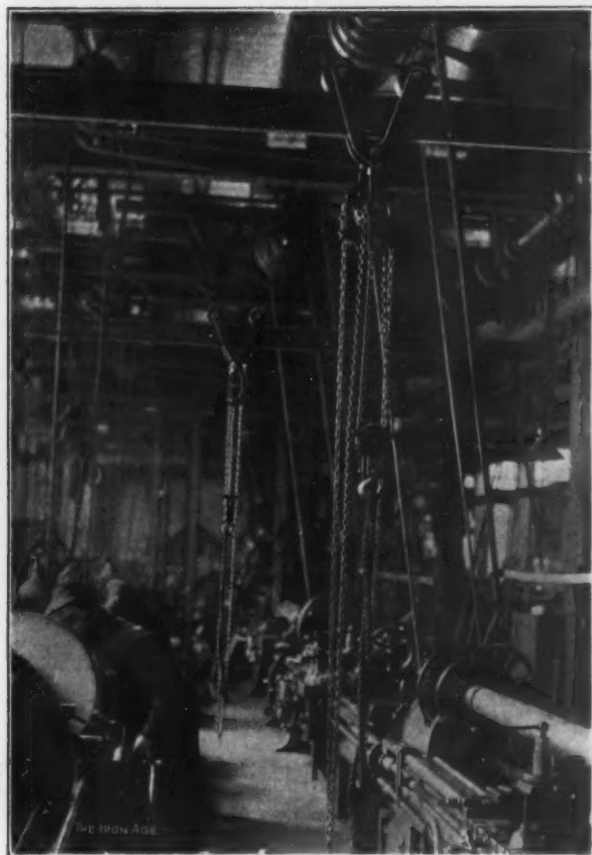


Fig. 14.—Cantilever Bracket Traveling Cranes Used Under Large Traveling Crane.

done when the clutch is in service, because the Diesel engine is irreversible and will not work well over any considerable range in speed of revolution. Direct drive is therefore utilized only for steady running.

One important question in connection with such an installation has been that of applying it to large powers. The largest at present available is a four-cylinder engine of 1000 hp. By using three propellers, 3000 hp. for propulsion may be obtained. It has been proposed, however, to operate the engines on the two-cycle principle, instead of the four cycle, and at the same time to make them double acting. This, it is said, would raise the power of each engine to 3000, and, by mounting two on each of three shafts, an aggregate of 18,000 hp. would be obtained. No such powers are at present contemplated for actual service, but a number of installations of about 360 hp. each have been put into commission, and the results are said to have proved very satisfactory. In some cases the arrangement above noted has been adopted, while in others the engines are placed amidships, or in some other convenient position, and the shafts actuated by



Fig. 15.—Scoop Bucket for Placing Small Stock in Bins.

greatest number of deaths from this disease in any one year were 22 per 100,000 population, as compared with 37 for Milwaukee, 43 for Boston, 57 for Baltimore, 64 for Detroit, 75 for Philadelphia, 89 for Washington, 90 for Toronto, 91 for Buffalo, 114 for Cleveland, and 160 for Chicago. The average for 16 years was: New York, 18; Detroit, 21; Milwaukee, 22; Boston, 28; Toronto, 29; Buffalo, 37; Baltimore, 38; Philadelphia, 44; Cleveland, 45; Chicago, 47, and Washington, 66. In all cases except Buffalo, Cleveland and Philadelphia the worst fig-



Fig. 16.—Unloading Crane at Machine Shop Door for Handling Work to and from Industrial Railroad.

ures occur during the first four years of the period under consideration. During the final eight years of the period Toronto (15), Detroit (16) and Milwaukee (18) showed better results than New York (19).

Design of a Cast Iron Pipe Foundry.

BY J. B. NAU.

In the *Engineering Magazine* for November, 1906, appeared a design of a pipe foundry plant by James V. V. Colwell, that embodies some new features in the arrangement and shape of casting pits intended to reduce labor and facilitate operations. The design is very similar to one proposed by the writer several years ago in a preliminary sketch that accompanied a report on pipe foundries and which he still further developed in 1905 in a drawing submitted for a pipe foundry then contemplated. Thinking that it might prove of interest to some of the readers of *The Iron Age*, a drawing is herewith given illustrating the principle on which the work was laid out and the reasons that led to the adoption of such an arrangement.

Both Circular and Longitudinal Pits Discarded.

After a visit to some of the best known American pipe foundries in the summer of 1904, with a view to gathering information on the best features to be embodied in a new layout of a pipe foundry, the writer proposed this design in which both circular and longitudinal pits are discarded. In this, as will be observed, he was principally guided by the desire to reduce labor, to utilize the room to the best advantage without crowding and to prevent the work in one department from interfering with the operations in another one. The circular pits were abandoned as unsuited to traveling cranes. The longitudinal ones were discarded because they require long buildings and cut up the foundry floor, and unless the buildings are very wide the clear room left on either side will be narrow and crowded. Besides, for the rapid handling of flasks, core barrels, &c., over long distances, fast and powerful traveling cranes are a necessity.

To remedy these defects, parallel transverse pits of sufficient length to give ample capacity were adopted. With their use the foundry building has to be wider, but its length can be considerably reduced, and with the same area covered it will be noticed at a glance that the available space outside of the pits is in much better shape for all purposes than with longitudinal ones. Naturally, the bridge travel of the cranes will be considerably reduced, less time will be lost in the handling of material and, the main work being done by the lighter trolley, less power will be spent.

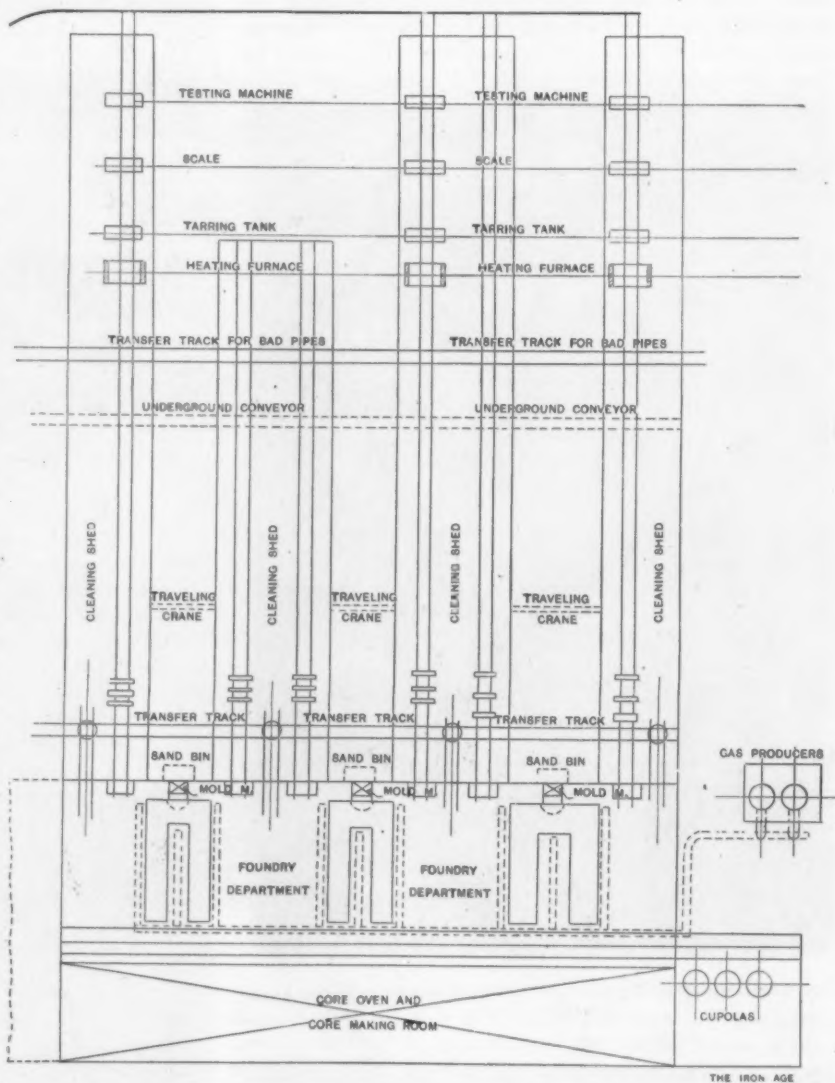
One Molding Machine Serves Two Transverse Pits.

Later, when inspecting some of the pipe molding machines and their operations, it was learned that all of them were able to mold much more than the capacity of one single pit. The consequence was that two adjoining pits were formed into one group, with a connecting branch at one end, in the middle of which was placed the molding machine, which was thus enabled to attend with the greatest ease to either branch of the corresponding group. The diagram shows a foundry with three groups of such pits in a building of from 80 ft. to 90 ft. clear span. The pits of each separate group must be made wide enough to accommodate two pouring rows of the size of pipe that it is intended to make there with enough space between the rows to handle the flasks in

the same manner as in any other pit. The design contemplates a molding machine on each group, but, when necessary, molding by hand can be resorted to.

Ample space should be left between the two branches of one group for pouring purposes and the distance between two contiguous groups must be wide enough to accommodate cores and core barrels coming from or going to the coreroom adjoining the foundry.

At the head of the coreroom stands the cupola department, on an upper floor or raised foundation, with an overhead track for liquid iron in front. This track is built on a bridge running the whole length of one side of the foundry and is high enough to leave a clear passage underneath for the handling of the cores between the foundry and the coreroom. With this arrangement, the liquid iron and the core services are kept entirely separate and will never interfere with each other.



Design of a Cast Iron Pipe Foundry.

It should be stated here that transverse pits and overhead liquid iron tracks are not new. When in Europe a few years ago, the writer saw a number of the most modern pipe foundries, the best of which are always laid out with transverse pits for big pipes and circular pits for smaller ones. In some, both small and big pipes are made in transverse pits in buildings of generally less than 70 ft. span and in older foundries even considerably less. Overhead tracks are used in some places for taking the iron from the blast furnace or cupola to the foundry. In this country, the writer understands, an overhead liquid iron track is used at the Chattanooga plant. He thinks, however, that he is the first one to propose these long transverse pits, in the shape here presented.

Producer Gas for Drying Molds and Cores.

The diagram also shows the use of producer gas for the drying of molds and cores, which is a practice that

has been followed very successfully in Europe for many years. The flasks are shaken out in the usual way over cleaning tracks that extend sufficiently inside the foundry to receive the pipes. Under the track ends are sand pits, into which the sand is shaken out, passed through screens and then removed by conveyor to a sand mixer, from which, after having received a sufficient supply of new sand, it is taken back again by a conveyor into overhead sand hoppers, one of which is placed behind each molding machine, outside of the foundry proper, to avoid interference with the traveling cranes.

The molding machine is placed at the end opposite the liquid iron and core services, thus avoiding any interference with the latter and affording at the same time the advantage of shortening the molding sand service between the shaking out pit and the feeding device of the molding machine. Each group is provided with two parallel cleaning tracks, on which the pipes run down by gravity, where they are cleaned by hand or by machine, then still further down emptied over an underground conveyor and after having reached a transfer track, where bad pipes are sorted and good ones transferred to the only skid of the group that is provided with the necessary finishing appliances, they are heated, tarred, weighed and tested and then taken either to the shipping yard or to the machine shop.

Each Group Complete in Itself.

Thus each group, with its cleaning tracks and finishing appliances, constitutes an entity in itself, connected on the finishing ends with the two other groups by means of the transfer tracks, thereby facilitating the transfer of pipe from one to another finishing department, should necessity call for it.

The distance between two contiguous groups also determines in a measure the distance between the two corresponding cleaning sheds. This latter space can then be kept wide enough to be used as a very convenient storage room for flasks, &c. An overhead traveling crane, running the whole length between two sheds can attend to this service and over the upper or lower transfer tracks the flasks can be taken with the greatest ease either to the foundry proper or to the machine shop.

Thus, without crowding, this space is made to serve a very useful purpose. The flasks are kept within easy reach of the pipe foundry proper and they can be handled with great facility and little trouble. It is not proposed to cover in this description the general plan of a pipe foundry, with all the different accessory departments, such as machine shop, special foundry, &c., as the location of these departments will depend largely on local conditions, railroad connections and other shipping facilities.

It is enough to say that the design should be so arranged as to have all the raw materials come in on one side on tracks that, without interfering with each other, would deliver such materials directly to the department where they are needed and that all departments should be located toward each other in such a manner as to have the material during its transformation into finished product always go forward, without a step back, until the pipes are delivered either to the pipe yard or to the machine shop before they go to the shipping yard. The shipping yard should be provided with traveling or other cranes to load the product on cars, or on boats when shipping by water, without interfering with the tracks of the incoming material. Wherever possible, traveling cranes should also be used for handling pig iron and coke in the cupola service, so as to reduce labor to a minimum. Minor departments and storerooms of every kind should be located in immediate proximity to where they are most needed.

The Frank Thomson Railroad Scholarships.—At a meeting of the Board of Directors of the Pennsylvania Railroad Company March 27, the offer of Anne Thomson, Frank Graham Thomson and Clark Thomson of a fund of \$120,000 to establish what are to be known as the "Frank Thomson scholarships" was accepted and approved. The purpose is to afford to "sons of living or deceased employees of all the lines of the railroad an

opportunity for a technical education, so as better to enable them to qualify themselves for employment by the company." Competitive examinations are to be held, open only to sons of Pennsylvania employees, "corresponding in general to the entrance requirements of the scientific departments of the higher class universities, colleges and technical schools." After passing the examinations held by the company the winner of a scholarship must qualify for admission to one of the technical schools or departments approved by the company before he receives his certificate entitling him to draw upon the scholarship fund. Beginning this year two scholarships, each of which amounts to \$600 a year, are to be filled, and every year two will be added. After four years two will be graduated annually, keeping a total of eight men in college all the time.

How a Great Railroad Increases Its Trackage.

In view of the suggestion of James J. Hill that railroad construction had fallen off in recent years figures have been compiled showing that during the year 1906 the length of lines of the Pennsylvania Railroad was increased 64.01 miles, but that 660.91 miles of new track were constructed.

Energies of late have been devoted to building sidings, terminals, third and fourth tracks and relief lines to take care of the enormous quantity of freight traffic with which the company has been burdened. These facts indicate that, while recent figures made public by the Interstate Commerce Commission show a small increase in mileage of the railroads of the country, the actual increase in railroad facilities is very much greater. Following the policy of making extensive improvements proposed by President Cassatt the Pennsylvania Railroad has, during the past six years, increased the length of its lines 359 miles and built 3631 miles of new track—more than 10 times as much as the increase in length of line.

More than half the increase in trackage on the Pennsylvania's lines, or 1863 miles, is in company sidings. This does not include private sidings connecting with the company's lines, but merely represents the improved facilities offered to the public for taking care of the rapidly increasing traffic. The remainder of the increase in trackage, representing 1409 miles, was laid to relieve congested points. For instance, relief lines have been built to divert freight from points where traffic is particularly heavy, third and fourth tracks have been added in several places, until to-day the Pennsylvania is a four-track line from New York to Pittsburgh, with the exception of two short stretches of three-track line in the mountain divisions.

The increase in capacity of its lines, due to the additions of this 1409 miles of track at congested points, cannot be calculated accurately, for the reason that a very short stretch of double or triple track may cut down enormously the operating efficiency of an entire division of four-track road. At such a contracted point freight trains will have to be held up to allow to passenger trains the right of way, and when a passenger train runs in sections, taking possible 15 or 20 min. to pass, several freights may be stalled before the tracks can be cleared for them.

The policy of the railroad company has been to provide enough tracks so that freight could be pushed through without stops, except those necessary for coal. To-day the slow freight trains going from Altoona to Harrisburg, a distance of 131 miles, stop only once for coal; the fast freight trains run through without any stop.

While the Pennsylvania system operates to-day 10,977 miles of line, it has in reality 23,109 miles of track. It operates 4.88 per cent. of the total mileage of the country, but it has 7.2 per cent. of the total trackage of the country. The lines are situated in 14 States, of which the following nine contain the major part: Pennsylvania, 4048 miles; Ohio, 1829 miles; Indiana, 1495 miles; New York, 814 miles; New Jersey, 766 miles; Illinois, 635 miles; Maryland, 548 miles; Michigan, 433 miles; Delaware, 273 miles.

An Important Seamless Tubing Decision.

The Shelby Steel Tube Company Wins Its Patent Suit.

For several years litigation has been in progress between the Shelby Steel Tube Company, Pittsburgh, and the Delaware Seamless Tube Company, Auburn, Pa., and others, involving the validity of the original Stiefel piercing mill, which is the foundation principle in the manufacture of seamless steel tubing. A decision in this case has been handed down on final hearing by Judge Archbald in the Circuit Court of the United States for the Eastern District of Pennsylvania, sustaining the claim of the Shelby Steel Tube Company. The decision is as follows:

The Decision.

The patent in suit is for a mechanical device for making metal tubing. It was granted to R. C. Stiefel, December 19, 1905, and title is now vested in the complainants by sundry mesne conveyances. This is denied by the answer and contested here, but is sufficiently established. The objection to the assignment from the patentee, that it was not proved by both the subscribing witnesses, is captions. It is elementary law that but one need be called, except where there is some special reason. (17 Cycl. Law and Pres. 435.) Still less there is in the suggestion that there is no proof of delivery. Not only was the assignment put on record, which is itself evidence of the delivery, but it was produced before the examiner by the complainants, showing that it is in their possession and is presumed to have got there regularly. Pray what would the respondents have more?

It is further said, however, that the immediate assignment to the complainants is ineffectual, because there is no description of the patent and because it was not recorded. But the assignment, in terms, is of all the property of the company executing it, in whom title was vested at the time, specifically including also, "the good will, patents, trademarks," &c., which certainly was good as a conveyance between the parties, and much more as against a stranger. It has been held that a sale on execution of all the property, rights and franchises of an insolvent corporation was effective to pass title to a patent owned by it. (*Erie Wringer Mfg. Company vs. National Wringer Company*, 63 Fed. 248.) And if so, why not also a voluntary conveyance, in similar terms? It is of no consequence that in this indefinite shape the assignment was not in a condition to be recorded, the only purpose of this being to protect subsequent bona fide purchasers for value. (22 Am. & Eng. Encycl. Law 2 Ed. 418.) It is somewhat strange, however, that so important a matter should be left open to question, when it was so easily remedied.

HISTORY OF THE ART.

The standing, if not the validity, of the patent is also challenged. Turning for its determination to the earlier art, it is interesting to observe that metal tubing came into vogue with the invention of illuminating gas in 1815, in England, the discarded musket barrels thrown out by the termination of the Continental wars being utilized for that purpose. This was followed at a later stage by lapweld and butt-weld tubes, which were made by heating a strip of sheet iron or steel to a proper heat and then bending it into tubular form, with overlapping edges, and welding them together on a mandrel, for the one, and by drawing the sheet through a ring or bell-shaped die and forcing together and welding the abutting edges, for the other, the strength of each depending upon the success of the weld.

This was the condition of things until 1885, when it was discovered by Mannesmann, a German, that tubes could be produced without seam or weld by passing a metal billet or blank between converging beveled disks or rolls, revolving in the same direction, by which it was flattened and compressed and subjected to a violent kneading action, which ruptured and opened up the center, and the billet in that condition, being forced forward against the point of a piercing mandrel located

at the axis of the pass, was further opened and shaped between the rolls and the mandrel, a hollow seamless tube being the result. This was a notable advance, to which everything that follows must bow. But it still left something to be desired.

THE CHARACTERISTIC OF THE MANNESMANN PATENTS.

A great variety of devices is shown in the numerous Mannesmann patents taken out upon it, but the one characteristic which appears in them all is that the rolls are symmetrically placed with their axes in parallel planes and the same sized diameters always opposed. The consequence is that the surface of the billet, being subjected to a different speed of rotation as it advances between the converging lines of the rolls by which it is gripped, a violent spiral wresting or twisting of the particles or fiber of the metal is produced. This seems to a certain extent to have been regarded as an advantage, and patents based upon it are found. And it may, indeed, impart a certain structural strength to the tube.

But steel billets are cast and so are crystalline in character, and the twisting opens up cracks or flaws, because of the extreme surface tension. Superficial defects frequently exist, and, being aggravated in this way, an elongated, longitudinal seam is produced, winding around the tube and making it worthless, a material percentage of the product having to be consigned in consequence to the scrap heap. Mannesmann seems in the end to have recognized that this more than offset the other advantages, and sought to overcome the twist by providing barrel shaped rolls, with larger diameter in the middle than at either end, the one being supposed to undo the effect of the other, the twist given by the converging lines of the rolls at the beginning of the operation being taken out by the diverging lines at the other end.

AN IMPROVEMENT NEEDED TO OVERCOME THE TWIST.

But this only made matters worse. It may have taken out the twist, but "with the knife." The metal being first twisted one way and then twisted back, if a seam was started by the one it was only increased and aggravated by the other, doubling instead of removing the defect. It was to remedy this situation that the patent in suit was designed. The device stands no doubt merely as an improvement upon Mannesmann, making use, as it does, of the same general principle and character of mechanism. But it is clearly distinguished, after all, by the different form and arrangement adopted. There are beveled rolls or disks in both, between which the billet or blank being first compressed is forced against the point of a piercing mandrel after it has been thus opened up. But, reversing the Mannesmann, the rolls are unsymmetrically set, one above the other, with their axes out of line, and so made to overlap that the bevel of the one is opposite the flat or plane surface of the other, whereby, except at the center, unequal circumferences, with different speed of rotation, are presented to or encountered by the billet in its course.

ROLLS SET OUT OF LINE ACCOMPLISH THE PURPOSE.

It is idle to argue that it involved no invention to rearrange the rolls in this way, accomplishing as it did what Mannesmann, an inventor of marked ability in the same line, had endeavored and failed to effect; or, that it was, in fact, no advance, although reducing the waste from over 4 to 1 1-3 per cent. And equally unavailing is it to suggest either that it was anticipated or that it amounted to no more than an adapted or double use, because sundry devices with overlapping disks or rolls, between which metal rods or tubes are somewhat similarly drawn or forced, are to be found in the general mechanical art. Such, for example, are the Reese (1867) for straightening cylindrical metal bars; the Brooksbank (1874) for rolling and finishing the same; the Hoagland (1874) for making cold rolled shafting; the Butler (1877) for rolling, straightening and finishing bars and tubes; the Reese (1881) for burnishing and ductilizing bars, shafts and tubes; the Dyson & Hall (British, 1870) for rolling and finishing the same; and the diffuse Robertson (British, 1878) for drawing, straightening, shaping and smoothing wires, rods, tubes, shafts, &c., and doing a little of every thing in that connection. The Flagler (1889) and the Jackson & Carlson (1891), which are also in the record,

are merely developments of the Mannesmann, designed to take advantage of rather than eradicate the spiral twist, and do not need to be further noticed.

As indicated by their recited purposes, the others mentioned belong to a class of machines in which beveled disks, rotating in the same direction, and forming a substantially parallel sided pass, are similarly employed, to roll, straighten, finish, smooth or polish the surface of cylindrical bars, shafts, rods and tubes. But not only do they fail to show the precise form or relation of the rolls or disks, of the device under discussion, but there is nothing in the use to which the rolls are put that is in any wise similar to or suggestive of their purpose here; the whole end and aim of the one being to affect superficially the articles treated, while the other ruptures structurally the billet operated upon, opening up the center and developing and shaping it into a tube without seam or twist—an entirely different and unrelated result as well as product.

THE CHARGE OF INFRINGEMENT.

The real controversy between the parties is over the charge of infringement. This depends upon the construction to be given to the patent, and whether the defendants' device is within its terms. The limitations, if any, imposed by the existing art no doubt are to be considered, and the original application, which was abandoned when the inventor, at the suggestion of the examiner, changed over from a process to a machine patent, and any concessions made in that connection upon which the patent was obtained are not of course to be lost sight of. These are familiar rules, not disputed by the complainants, but there is little occasion for their application here. There are two claims to the patent, both of which are relied on as follows:

1. The combination of two parallel disks revolving in the same direction and overlapping each other, one of said disks being beveled at its outer edge, which beveled surface is opposed to a portion of the plane surface of the other disk; the outer diameter of this plane surface and the inner diameter of the beveled surface opposed to it being substantially the same and the edges formed by both diameters intersecting the same transverse plane through the pass between the disks; the angles of the opposing surfaces converging to this plane, which is at the narrowest part of the pass, with a conical mandrel lying in the axis of the pass at its exit side, substantially as set forth.

2. The combination of two parallel disks revolving in the same direction, beveled at the edges of their adjacent faces and overlapping each other so that the beveled portion of one disk lies opposite a flat portion of the other disk, the edges formed by the smaller diameters of the beveled portions of the disks intersecting the same transverse plane through the pass between the disks, whereby the sides of the pass first converge to this plane and then diverge beyond it, with a piercing mandrel located between the diverging sides of the pass and exactly in axial line of the pass, substantially as hereinbefore set forth.

THE STIEFEL INVENTION DESCRIBED.

The object of the invention, as already stated, is to make tubing without torsional wrost or strain. "This result," according to the specifications,* "is accomplished by imparting to the blank a substantially uniform speed of rotation throughout all those portions of it in the grip of the working surfaces of the disks. At the point X X (referring to the diagram) where the pass is most contracted and the grip of the disks on the blank the greatest, the radii $x x'$ of the two disks is the same, and consequently the speed of rotation imparted to the blank at this point by both disks is the same. At the line Y Y in the pass, while the radius y of one disk is smaller than the common radii $x x'$ of both disks, the opposing radius y' of the other disk is proportionately greater than the common radii $x x'$; so that the mean effective rotative action imparted to the blank by the two disks at the line Y Y is the same as that imparted to it at the line X X; or, to express it in another way, the circumferential speed of the disk A is slower at its radius y than at its radius x , and consequently its rotative action on the blank is slower at Y than it is at X, but the circumferential speed of the other disk B at its opposing radius y' is as much greater than at x' as y is slower than x , so that the mean effective rotative action upon the blank of the smaller and larger radii $y y'$

of the two disks, respectively, is the same as that of the common radii $x x'$. Consequently that portion of the blank lying within the grip of the disks at the line Y Y is rotated at substantially the same speed as that portion at the line X X. As this condition prevails in every point in the grip of the disks between the lines X X and Y Y, a larger radius and greater circumferential speed of one disk being opposed by a smaller radius and slower circumferential speed of the other, there is practically no twisting of the blank within the grip of the disks by reason of one portion of the blank being rotated faster than another portion. There might, if there were no slippage, be a slight difference of speed of rotation of portions of the blank within the grip of the rolls, due to the fact that the diameter of the blank is slightly smaller at X X than it is at Y Y, but owing to the slippage this does not occur, and the blanks, when they leave the pass between the disks, have their fibers substantially straight and parallel throughout.

THE MECHANICAL MEANS PATENTED, NOT THE PROCESS.

This full and clear exposition leaves little to be said, either with regard to the principle of the invention or the mechanical means by which it is sought to be carried out. And it is the mechanical means, of course, and not the method or process—much less the result—that is patented, and is to be looked to, in determining

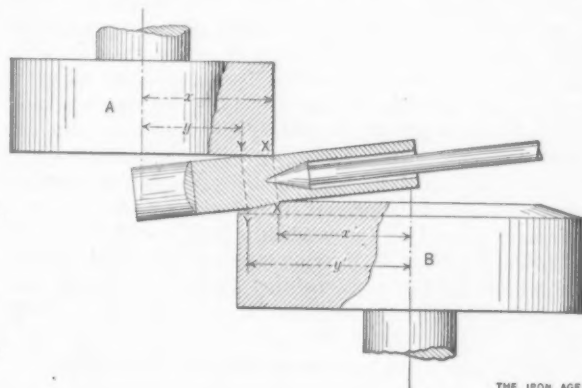


Diagram Illustrating the Stiefel Method of Piercing a Billet in Making Seamless Tubing.

whether infringement exists. The defendants are supposed to escape, because, as it is said, the inventor is confined by the prior art to the precise construction claimed, and has committed himself, for both the converging and diverging lines of the pass, to a plane or flat surface on one disk, opposed to and coacting with a beveled surface on the other, which the defendants, admittedly, do not have. The drawings of the patent lend support to this contention; but they are expressly declared in the specifications to be more or less diagrammatic, and not intended to represent "the exact proportions and relations of the disks and their working surfaces, to be followed under all circumstances"—a reservation which allows of not a little latitude.

But, more than this, the controlling and distinguishing feature and principle of the invention consists not so much in having a plane or flat surface—that is to say, one in the exact plane of rotation, at right angles to the axis of the disk—opposed to one that is beveled, converging to as well as diverging from the center of the pass; as that, at different points, other than the center, the diameters and so the circumferential speed of the disks shall be unequal. It is this counterbalance that preserves the fiber from distortion, and it is secured by the placing and functional relation of the disks, and not by having the opposing surface plane or beveled, which merely provides the necessary convergent and divergent lines to draw in and compress the blank. Nor is just what is meant by a plane surface, except perchance as it is contrasted with a bevel, particularly defined in the patent.

THE INFRINGING MACHINE.

The machine used by the defendants which is put in evidence shows each of the disks with a flattened cen-

* Letters patent No. 551,340, dated December 10, 1895, granted to Ralph Charles Stiefel, Ellwood, Pa.

tral portion at right angles to the axes; then a slight incline or bevel of about 3 degrees for the space of some 4 in.; and then a sharp bevel of 10 degrees the rest of the way to the edge; the rolls being so set that the lesser bevel of the one disk is opposite the sharper bevel of the other. It is upon this variation that the defendants rely to escape infringement; beveled surface being opposed to bevel, as it is pointed out, and not bevel to flat, as specified in the patent. But this evidently studious avoidance of the terms, while obtaining the benefit of the principle of the patent, cannot be sustained. Except where form is of the essence of the invention it has little weight. (*Machine Company vs. Murphy*, 97 U. S. 120.) And changes much more significant have been many times held of no importance, the principle and mode of operation being maintained. (*Ives vs. Hamilton*, 92 U. S. 431. *Elizabeth vs. Pavement Company*, 97 U. S. 137. *Hoyt vs. Horne*, 145 U. S. 302. *Diamond State Iron Company vs. Goldie*, 84 Fed. 972.) The spirit rather than the letter governs; having regard to which, the claims in the present instance must be held to be fulfilled by a relatively flat or flattened surface opposed to a bevel, the operative result remaining unchanged.

The slight inclination which is given in the defendant's machine to a fractional part of the inner flattened portion of the disks is the full mechanical and functional equivalent of the plane or flat surface called for by the patent, of which it is a mere plausible variation, being hardly distinguishable from it to the eye, and playing identically the same part. By it and the opposing bevel of the other disks the necessary converging lines, to grip and compress the billet, are supplied; and the two disks being so positioned with respect to each other, that the opposite diameters, at different points, whether flat or beveled, are unequal, the distorting effect on the surface of the billet is avoided, which would otherwise be produced. This is the whole principle of the invention, which is thus appropriated bodily; the same mechanical means—substantially, if not literally—being made use of to carry it out.

THE CLAIM THAT THE MACHINES ARE NOT ALIKE.

It is said, however, that a twist is made by the defendants' machine (which still, as it seems, is claimed as an advantage, because it discloses flaws and saves the putting out of defective work) and that judged by the product of the two machines are not thus alike. The inventor, as it is argued, differentiated his machine in the patent office by the result, and having so characterized it and obtained a patent upon the strength of the representations as to what it would do, he is now tied up to a no-twist tube, which, if not produced by the natural operation of the defendants' machine, it does not infringe. But the patent, as already stated, is not for the product, but the mechanical apparatus for making it, and the object to be attained is to be carefully distinguished from the means taken for doing so. And while it is true that the purpose of the invention was to avoid a twist, and it might well be claimed that a machine which was not arranged to and did not do this did not come within its scope; where, on the other hand, the mechanism employed is substantially the same, that for some reason, designed or otherwise, its operative effect is made to vary, cannot be altogether accepted as the test.

That is particularly the case where it is shown, as it has been here, that if the tubing turned out by the defendants is not what it might be with respect to a twist, it is the result of not doing all with it that might be done. Whatever the form of the machine, in order to do the best work the mandrel must be set so as to meet and pierce the billet at the narrowest point of the pass, and if it is not there will be more or less of a twist, due to the greater resistance of the mandrel when it is withdrawn to a point where the piercing of the billet is relieved. This is a well-known effect, common to all mills, and within the control of the operator. Being a mere matter of how the machine is run, it does not enter into the case. The patent does not prescribe how or where the mandrel shall be set (except as a preference is expressed for locating the axial line of the pass a little below the center of the rolls), and if its terms are other-

wise fulfilled it is of no consequence that the mandrel is not so adjusted longitudinally as to bring about the best results.

If a perfect or imperfect product is to determine the question in any case infringement would be made to vary according to the skill of the operator, and whether the machine was well or badly run. This is not, of course, the criterion. A misuse detracting from its utility does not change the mechanical combination or the essential character of the device. (*Penfield vs. Chambers*, 92 Fed. 630. *King vs. Hubbard*, 97 Fed. 795.) The mechanism being substantially the same it is the possibilities that reside in it, under ordinary and proper use, that are to decide; and as to that there can be no question here. The defendants, if they desire, may retract the mandrel, so as to produce a twist, but to do so is a perversion, the natural operation being the other way; and the resultant product, when the machine is correctly and normally run, being the same as that of the complainants, the last pretence for distinguishing it is removed and infringement is made out. This applies not only to the company, but also to the defendant Driscoll, who has been an active agent in promoting the infringement, although not to the other defendants, who are not so involved. Let a decree be drawn sustaining the patent and finding that it has been infringed, with the usual relief incident thereto, with costs.

Investigations of Machinery Failures.

Accidents and breakdowns of machinery and their causes have been undergoing analysis in England. With engines the causes, covering a period of 25 years, are placed at the following percentages:

	Gas and Steam.	oil.
Due to weakness, faulty design or bad workmanship.....	22	25
Due to old defects and wear.....	32	13
Due to negligence of owners or attendants.....	24	18
Due to accidents or causes not ascertained.....	22	44

The origin of accidents to electric motors and dynamos is said to be divided about as follows, in percentages:

	Dynamos.	Motors.
In armatures and rotors.....	53	48
In commutators and brush gear.....	25	28
In magnet coils and stators.....	6	13
Miscellaneous	16	11

With the engines the most prolific source of accident was in the valves and valve gear, both for steam and for gas and oil engines. Next in importance in steam engines were spur gearing, air pump motions and air pump buckets and valves. In gas and oil engines the accidents, after valves and gear, were due most often to cylinders and cylinder ends, pistons, connecting rods and bolts, main shafts and governor gear.

A Notable Water Power.—Hydro-electric generating stations are numerous in California. One of the latest has recently been completed on the north fork of the San Joaquin River in the Sierra Nevada, 50 miles northeast of Fresno, by the San Joaquin Light & Power Company. The conduit supplying water for the operation of the units has a total length of 4.3 miles and comprises open canal, tunnels, flumes and a pipe line. These aqueducts are designed for a flow of 100 cu. ft. per second, which, with a total available head of 400 ft., will produce a total capacity of 3600 hp., with a prime mover efficiency of about 80 per cent. The canal portions of the conduit are 5 ft. wide and 3 ft. deep, and are lined throughout with concrete. The intake basin of the conduit and the forebay at the power house are also built of concrete and the tunnels of the aqueduct are lined with this material. The flumes, which are semicircular, have a diameter of 6 ft. and are constructed of steel plates $\frac{1}{8}$ in. thick. The pipe line is 3000 ft. long and has a diameter of 52 in. It is constructed of steel plates varying in thickness from 3-16 in. near the top to $\frac{1}{2}$ in. at the bottom. The station contains two tangential water wheels, each of which drives a 1000-kw. generator at 300 rev. per min. The operation of the generators is three-phase, the voltage being 550. Two direct-connected exciters of 62½ kw. each are provided.

An Early New Jersey Iron Enterprise.

BY RICHARD PETERS, JR.

A recent news item mentioning the purchase of the town of Allaire, Monmouth County, New Jersey, by a New York capitalist, and his purpose to develop the rich farm lands in the vicinity, recalls a long forgotten iron industry that flourished there in the early part of the last century. Unlike the majority of the charcoal blast furnaces which once were one of the leading industries of the State, this one had a diversified number of outlets for its product, and might well serve as an early example of the "from ore to finished product" plants of to-day.

Early in the nineteenth century James P. Allaire, a Frenchman of means, purchased a vast tract of land in Monmouth County, having found there what was then



The Charcoal Blast Furnace at Allaire, N. J., as It Appears To-day.

considered a great bed of bog iron ore. The pine forests nearby afforded the means of fuel, and for years the woods rang with the axes of the charcoal burners. The oyster industry was carried on mainly for the purpose of producing a fluxing material, and one can still see where the flat boats came up the river to deliver oyster shells to the furnace.

The first stack was built in 1810, but was shortly afterward torn down to make way for a more approved design, and in 1832 the furnace was erected which now stands. This stack had a record of 16 tons a day, then a remarkable make. Its construction, too, was quite an achievement of the time, for the furnace stack to-day is practically as it was three-quarters of a century ago, save that a few of the iron binders have slipped from their place. The design differs very materially from what was then customary, and while the writer has seen the ruins of a number of long abandoned plants, he has never reconciled the types with that of the old stack at Allaire. The hearth and bosh portion is 15 ft. high and of finely hewn sandstone, held firmly in place with great iron tie

rods, very similar to the method employed in the old stone furnaces. The tuyere and working arches are of Gothic design and are as unobstructed to-day as they were when the furnace was in operation. The upper part is of circular brickwork, some 40 ft. high, banded with flat iron, and so well built that the ravages of time, coupled with the effect of trees growing from the stack, have not served to destroy it. An illustration in Overman's "Manufacture of Iron," published in 1850, shows such a furnace built in France, and it is likely that Allaire drew upon the ideas of his mother country for his design.

The enterprise, which was known as the Howell Iron Works, grew rapidly and in 1832 several thousand people were dependent on it, a number of them being skilled iron workers from Scotland. The company issued its own paper money, redeemable for all the commodities needed by the workmen, and it is said that this was the forerunner of the store check system of to-day. So strong was the credit of the company that the scrip bearing the name of the Howell Iron Works was accepted practically all over the State. In 1832 it was estimated that the plant had a valuation of over \$1,000,000. A good-sized town was built, with churches and schoolhouses, all clustered around the iron works. A foundry adjacent to the furnace produced many cylinders for the early marine engines, and it is claimed that Fulton obtained castings here for some of his early experiments in steam navigation. Certain it is that John Roach, the great shipbuilder of Pennsylvania, served an apprenticeship at Allaire, and the house in which he lived is still standing, and is pointed out to the visitor. A screw factory was erected in the early twenties, and other shops helped in the utilization of practically all the metal that was produced at the furnace. Allaire was an inventive genius, and it is said that iron window and door casings were conceived by him. It is indeed remarkable to note in every one of the ruined buildings that they were supplied with these features. A canal was built to connect the plant with one of the old waterways which had its outlet in New York Bay, thus affording an important means of getting product to market.

The use of anthracite coal in the Pennsylvania blast furnaces in the latter thirties furnished competition which many of the New Jersey iron enterprises could not stand, and among them fell Allaire's plant. The workmen soon left for more active fields, and the town fell to decay as rapidly as it had grown. Nature has assisted in making it a picturesque "deserted village," which for many years has been a rendezvous for summer residents on the Jersey coast. The broken dam, covered with the vegetation of 70 years, which once held the power that drove the blast furnace blowing engine and the machinery of the mills; the grass grown slag heaps; the ruined buildings; and finally the old open topped furnace, its fires out forever, with great locust trees growing from it and covering the stack with their dense foliage, all show that nature has claimed back her own.

It seems strange that no mention of Allaire and his Howell Iron Works is given in the history of the iron industry of the United States, and it may be that its short life was the means of its escaping notice; but it is certain that the ruins at Allaire afford an interesting contrast with New Jersey's present place as an iron producer, so well exemplified by the magnificent plant at Wharton, only 40 miles away.

Joseph H. Hoadley, president of the Alabama Consolidated Coal & Iron Company, claims that the Ruffner mine of that company, near Gate City, Ala., is mining iron ore as cheaply as any other mine in the world. The cost of the ore is stated to be not in excess of 70 cents per ton, delivered at the company's furnaces.

For the American Foundrymen's Association convention, at Philadelphia, May 20-24, the secretary, Richard Moldenke, Watchung, N. J., announces the selection of the Hotel Bellevue-Stratford as social headquarters. Reduced railroad rates on the certificate plan are said to be practically assured.

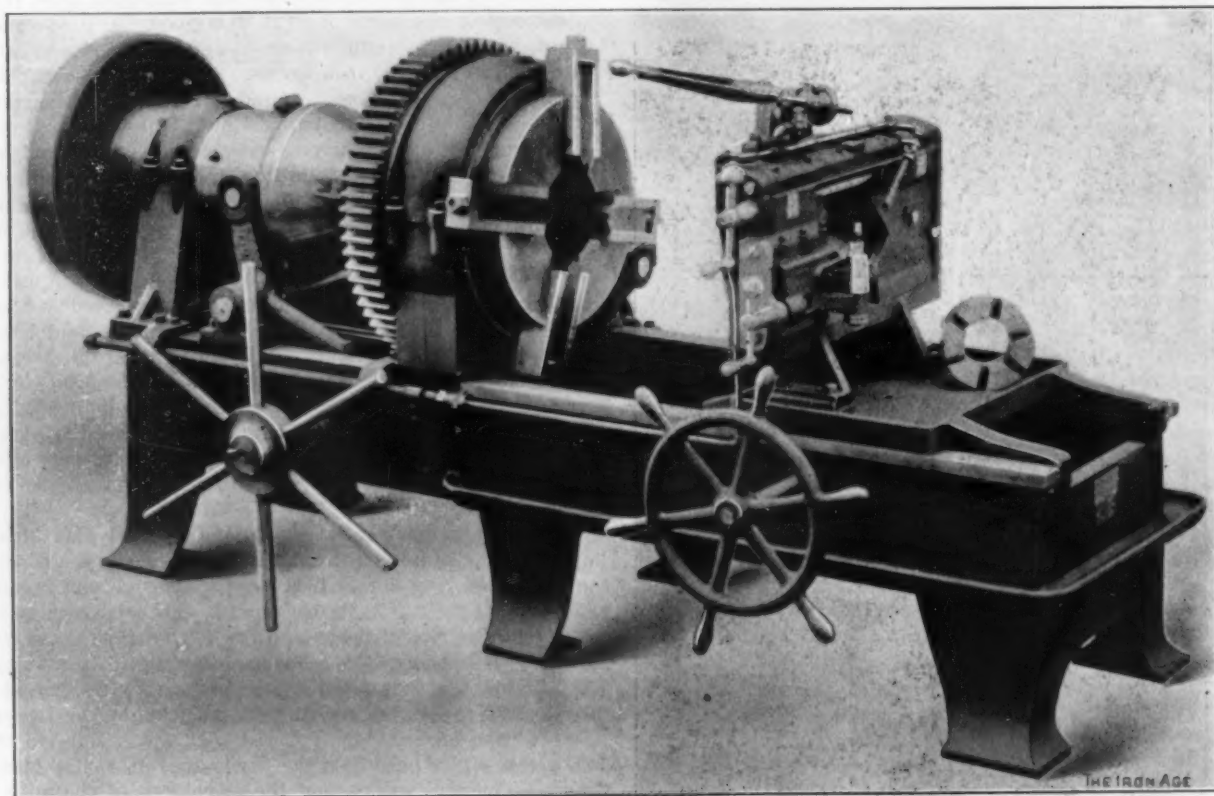
A New Bignall & Keeler Pipe Threading and Cutting Machine.

A new size of pipe threading and cutting off machine, known as the P. D. Q. C. No. 6, has recently been brought out by the Bignall & Keeler Mfg. Company, Edwardsville, Ill. The machine is particularly adapted for shops having large quantities of pipe of one size to thread at one time. It is equipped with a quick operating chuck, controlled by a hand wheel and pinion which engages in a segment gear on the end of the cone shifting arm. The cone slides freely on the arbor, and as it is moved forward rollers on the ends of the chuck jaw arms roll up on the surface of the cone, and the arms being thereby spread apart tighten the jaws on the pipe. When the cone is retracted springs draw the jaws away from the pipe. As this gripping chuck can be operated while the machine is running, the jaws being once set for a given size of pipe, an entire lot can be threaded without stopping the machine. The steel jaws in the chuck are grad-

air pump in obtaining and maintaining a high vacuum for engine and turbine operation. On account of the greater range of expansion dealt with in the steam turbine, as compared with the reciprocating engine, a good vacuum is much more essential in the case of the former than of the latter, and the condensing plant requires careful attention. The augmentser consists of a small steam jet placed in a contracted portion of a pipe led from the bottom of the condenser. The jet draws air from the condenser and delivers it to the air pump through a small auxiliary cooler. By this means the air left is reduced to a negligible quantity. It is said that the vacuum augmentser has been fitted in several installations on board ship, and with very good results.

The Alberger Pump Company.

Announcement is made that the Alberger Pump Company has been organized to manufacture and sell centrif-



The P. D. Q. C. No. 6 Pipe Threading and Cutting-Off Machine Built by the Bignall & Keeler Mfg. Company, Edwardsville, Ill.

uated, which facilitates the setting for a given size of pipe.

The die head is of the Peerless type, as used on the machines of similar type manufactured by this company, in which the dies can be instantly released from the pipe after the pipe is threaded. The cutting off tool is held in the slide on the front of the die stand and a reaming tool for removing the burr from the pipe is also provided.

The rear chuck is provided with three independent jaws with which fittings can be made up, and also a bushing for holding the pipe central without gripping the pipe.

The drive is from a four-step cone pulley at the back, which in connection with compound shifting gears affords eight changes of speed. The machine can be arranged to be driven either by belt or motor. An automatic oil pump in the bed of the machine supplies oil to both the dies and the cutting off tool.

The machine illustrated occupies a floor space of 50 x 120 in., and weighs in the neighborhood of 7500 lb. Ten other sizes of the machine are made, ranging in pipe capacities from 1¼ to 6 in. in diameter, inclusive.

A new apparatus, known as the vacuum augmentser, has been introduced to assist the ordinary condenser and

ugal and turbine pumping machinery embodying novel and important improvements. This apparatus has been designed especially to meet the demand for a higher class of work and more economical performance than has heretofore been attained. The company is prepared to build centrifugal and turbine pumps of all capacities and for operation against any head, either steam power or electrically driven.

The officers, management and works of the company are identical with those of the Alberger Condenser Company, 95 Liberty street, New York, and in order to provide for this business a large addition to the shops is now in progress. The equipment will consist of special tools for this particular class of work and elaborate testing apparatus is being installed to insure the highest efficiency of the product before shipment to the purchaser. The latter company has installed and operated many hundreds of centrifugal pumps and the experience thus obtained is stated to show that all that this type of pump requires to place it in the lead is careful design and conscientious construction.

The Alberger Pump Company is prepared to make surveys of plants and to furnish plans, drawings, specifications and estimates, and to contract for centrifugal and turbine pumping machinery for all services. A branch office is maintained at 205 La Salle street, Chicago.

Substitutes for Copper.

At no time since copper has become such an important element in manufacturing has its price been so high. In fact, to find higher prices than those now prevailing for ingot copper one must look to the period following the Civil War previous to the resumption of specie payments. The metal, however, was then quoted in a depreciated currency, and at that time, too, copper was used in but comparatively small ways, for in 1874, the most recent year in which prices were higher than at present, the production in this country was only 17,500 tons, against an estimated production of over 425,000 tons in 1906. Coincident with the greatly increased output there is a larger proportion of American made copper now available for home consumption than ever before, but it is becoming more and more difficult, if not impossible, to trace the consumption of copper through the many channels in which it is now so largely used. One of the industries which uses the greatest amount of copper is the construction of long distance and city telephone enterprises. When it is known that there are over 7,000,000 telephones now in daily use, with the number being added to at a constantly increasing rate, it can easily be inferred that a huge amount of the metal is used in this one direction. Vast quantities are used in transmission lines for electric lighting and power concerns, as well as for feeders and conductors to supply power to urban transportation systems. Steam railroads are also beginning to require large quantities to be used in electrifying portions of their systems, and the movement bids fair to increase rapidly. The use of copper for wire of one form or another exceeds any other one use, though sheet copper is becoming more widely recognized as a building material, not only for cornices, but as an outside sheathing for concrete structures and for window frames and skylights. Its high electrical conductivity is probably the most important of its physical properties, standing as it does in this respect as 97½ to 63 when compared with aluminum, the next best electrical conductor.

The Problem of Substitution.

Copper has been so widely employed in the arts and is commanding such comparatively high prices that the problem of substitution or alloying has become almost as much of a classic as that of perpetual motion. Among the methods by which an important saving can be effected in the use of copper is the welding of copper and steel, whereby for many purposes the desirable properties of copper are secured with a minimum use of such a dear metal. This had long been sought without success, but a method was at length evolved and a combination of copper and steel has been on the market for some two years. This process, which is called the Monnot process, produces an autogenous union of the metals, which are welded together in the ingot or billet in a predetermined proportion, which proportion continues constant throughout the entire process of drawing or rolling. Wire made by this process has been drawn as fine as No. 39, and on careful analysis it has been found that the proportions of copper and steel were exactly the same as in the welded ingot. A description of this process, its discovery and method of manufacture was given in *The Iron Age* of January 4, 1906. Wire of this description combines the requirements of a good electrical conductor and at the same time has the advantage of a much higher tensile strength than ordinary copper wire of the same size. It is well known that the smaller sizes of copper wire are necessarily of greater cross section area than required for the electrical conductivity, but because of the low tensile strength of the metal they are made of a sufficiently large cross section area to give the requisite strength.

Requirements for a suitable electrical wire to be used in out of door construction are such that it must have a high conductivity, be inexpensive in first cost, be readily twisted, and that it can be soldered or welded, so that a joint can be made which shall be mechanically and electrically perfect, capable of sustaining rough usage, and when strung on poles have but little sag. Pure copper

wire will fulfill some of these requirements to perfection. It is an ideal conductor of electricity, can be soldered with ease, but it is expensive. The slightest scratch or break in its surface renders it extremely liable to breakage. This is because practically the entire strength of copper wire is in the thin outside film, and kink in the wire abstracts by far the greater part of its tensile strength. For this reason copper wire must be handled extremely carefully when stringing on poles, particularly in rough country. On account of its low elastic limit and breaking strength it is necessary that supports should be placed at comparatively short distances apart. Wire of the Monnot process, on account of its steel core, has a much higher tensile strength, and therefore a wire made by this process will have a much greater strength than a pure copper wire of the same cross section area. It has the added advantage that it is much less liable to break under the accumulation of ice and snow, because there is less superficial area for accumulation.

Strength of Monnot Copper Clad Wire.

Wire of this description has been on the market long enough so that comparative tests have been made to determine the feasibility of its use for telephone lines. The breaking strength of No. 17 copper clad wire, as this new wire is called, and No. 14 new British standard copper wire is the same—190 lb.—but the weight of No. 14 solid copper wire is 65 lb. per mile, while that of the No. 17 copper clad wire is 29 lb. This affects no inconsiderable saving, not only because of the weight of the wire itself, but the new wire being partially composed of steel is cheaper per pound. The saving in poles and cross arms is also a large item and one which will increase with the greater cost of poles.

A series of comparisons has been made by the Duplex Metals Company, 208 Fifth avenue, New York City, seller of the Monnot wire, which shows that the net cost of a mile of No. 14 solid copper wire is \$47.90 at the present price of copper. This cost is based on wire 15 years in place, and includes not only the original cost of the wire, but the cost of stringing it, the interest for the period named and the expense of taking it down, with allowance for its scrap value. The cost of No. 14 copper clad wire under the same conditions is \$33.79, which shows a saving of \$14.11 per mile for wire having a conductivity sufficient for the requirements.

This process of welding metals is not only applicable to iron and steel, but to other metals as well. Silver can be welded to steel, and the billet rolled and rerolled in any desired shape, and it always keeps the same constant ratio of the baser and richer metals present in the ingot. By this process sheets are rolled, and this new combination appears to offer a field of almost unlimited value for cooking utensils, roofs of buildings, as well as the numerous other uses to which sheet metals are placed. It is understood that a large manufacturer of turbine engines is using turbine blades made by this process.

The use of fuel oil on the United States torpedo boat Gwin, after a thorough trial lasting a year, it is said, is to be abandoned. The best speed obtainable with oil for fuel was only 16½ knots, while a boat of duplicate construction, fitted for burning coal, shows a speed of 21 knots. The boats in question have a length of 99½ ft., a breadth of 12½ ft. and a draft of 3¼ ft. The displacement is 46 tons and the designed speed, with 850 hp., was 20 knots. On her original trial trip, burning coal, the Gwin made 20.88 knots. There is a single screw, operated by a vertical triple-expansion engine furnished with steam by a Normand boiler.

A method whereby the heavy turrets on battleships may be rotated so slowly as not to interfere with the continuous aim of the gunners is reported to have been devised by officers of the United States Navy. This is contrary to the opinion heretofore held that a turret should rotate quite rapidly. The new arrangement involves the installation of an additional small auxiliary motor, which makes it possible to greatly diminish the speed of the turning turret.

The Effects of the San Francisco Earthquake on Buildings.

A series of profusely illustrated reports has just been published in the *Transactions* of the American Society of Civil Engineers, dealing with the effects of the San Francisco earthquake of April 18, 1906, on engineering construction. The reports were prepared by a general committee and by six special committees of the San Francisco Association of members of the society, including committees on geology, on buildings, on water works, on lighting and street railroad transportation, on sewers and on railroad structures.

The committee on fire and earthquake damage to buildings consisted of J. D. Galloway, M. C. Couchot, C. H. Snyder, Charles Derleth, Jr., and C. B. King. The conclusions of these experts are very valuable, and are as follows:

Effects of the Earthquake.

The effect of the earth motion is to set a building in motion. The structure is thus subjected to all the stresses occurring in a truss sustaining a live load. The amounts of the stresses are unknown, and cannot be predicted, as the intensity of the shock is unknown. Obviously, the shock may range from a tremor to that of a violence that would wreck any building. Again, should the earth-slip take place beneath a building, it would be wrecked. Sufficient evidence is at hand to warrant the statement that a building designed with a proper system of bracing to withstand wind at a pressure of 30 lb. per square foot will resist safely the stresses caused by a shock of an intensity equal to that of the recent earthquake in California.

The prime requisite of the structure is elasticity. This must be understood as the ability of a structure to return to its original form after distortion. This elasticity allows the building to absorb the motion of the earth, where a more rigid structure would be ruptured.

VERTICAL MEMBERS NECESSARY.

To this requirement, the building with a timber or steel frame answers very well. The reinforced concrete structure does so also, with the exceptions noted below. The building with stone, brick or block construction, having horizontal mortar joints, does not answer the requirement at all. It may be stated, as one of the most obvious lessons of the earthquake, that brick walls, or walls of brick faced with stone, when without an interior frame of steel, are hopelessly inadequate. As a method of building in earthquake countries, such types are completely discredited.

To resist the shearing effect of the horizontal earth motion, vertical members are necessary. The shear is transformed into diagonal forces, which appear as stresses in diagonal and horizontal members. There was probably no better illustrated lesson of the existence of diagonal stresses than that offered by the innumerable instances of the cracking of brick and stone work along diagonal lines. In relation to this, it may be stated that a brick spandrel wall adds little, if any, to the bracing of a steel frame. Many of such walls were cracked badly, and moved on the supporting girder. No reliance should be placed upon them, as they are open to all the objections stated in connection with brick walls in general. The well designed steel frame offers the best solution of the question of an earthquake-proof building, as all the stresses can be cared for. The well designed timber framed house is also adequate. A reinforced concrete building offers a solution, but is open to the following objections:

OBJECTIONS TO REINFORCED CONCRETE.

Architectural reasons demand that diagonal bracing shall not be used except on rare occasions. This is overcome by the use of gusset plate knee braces and portal braces in the steel frame. Such design induces severe bending moments in the columns and girders; and in the girders the moment may be of the opposite character to that of the floor loads, thus producing tension in the upper flange of the girder. As at present designed, no re-

inforcement is used at that point, and hence such a girder would be defective. Again, it will be found upon analysis that relatively great stresses occur at points where the girders join the columns, especially in the lower floors of tall buildings. Here, again, the reinforced concrete construction, as now designed, is weak. These remarks are offered more in connection with high buildings. They can be overcome by the designer in reinforced concrete. All the evidence in the recent shock favors reinforced concrete, but the writers are of the opinion that the steel frame offers the best solution of the problem.

Foundations did not suffer at all, no instances of any damage having come to hand. Some discussion has taken place as to the advisability of making a monolithic mass under buildings. Several of these have been constructed, such as the Claus Spreckels, Mutual Savings Bank and Bullock and Jones buildings. They are all of relatively small base. It is commercially impossible to construct a monolithic base under a building, say, 12 stories high, and having a base of 150 ft. Buildings of that size and larger, with isolated pier foundations, suffered no more than others. The evidence is that foundations well built, along accepted lines, are adequate. It might be claimed that, if such had been used in large structures, the damage would have been less. The evidence does not point that way, for even if the monolithic base were sufficiently strong to resist the vertical earth motion, the horizontal motion would still vibrate the structure.

FLOOR AND PARTITION CONSTRUCTION.

Evidence for floors is not conclusive, as all terra cotta arch floors were afterward burned. Terra cotta arches covered with concrete stood without much damage in the brick portion of the Stanford University Museum. The terra cotta there could not be seen. Analogy with masonry walls would seem to say that many of the joints would be broken. Ordinary concrete floors stood the shock with but little damage.

In the case of partitions, those of terra cotta tiling were everywhere cracked and opened. It amounted to practical destruction in most cases. In this case, earthquake damage can be distinguished from fire damage. Partitions of metal studs and lath suffered less, but plaster was badly cracked. Nothing seems to be suggested for a partition in which the plaster would not be destroyed.

For rear walls, reinforced concrete offers the best solution, the reinforcing members being tied to the steel frame. A facing of brick or stone could be backed with reinforced concrete. In the case of stone, the parts should be doweled together, and, if possible, all tied to the steel frame. Terra cotta as a facing for walls is admirable, in this respect, as it offers superior facilities for tying it to the steel frame. For fire and parapet walls, the steel frame should be carried up, and anchors should be provided.

Brick chimneys, large and small, are open to all the objections of brick walls, only in a more marked degree, owing to their isolated design. Reinforced concrete seems to offer the best method for such construction.

Arches with voussoirs are not able to resist earthquakes. The motion opens the joints, and the keystones fall, thus thrusting aside the abutments. Evidences of this exist everywhere.

DESIGN MORE IMPORTANT THAN WORKMANSHIP.

Finally, it may be questioned whether difference in workmanship was not responsible for many of the results. While it is true that good workmanship gave better results than ordinary, it is still the opinion of the writers that it was mainly a question of design. Agnews' Asylum was of brick, laid in a fair grade of lime mortar. Ten miles away, on similar ground, St. Patrick's Academy, of similar design, was of brick, laid in lime and Portland cement, and there was better work than at Agnews'. The damage at the latter place was less than at the former, but, as far as use was concerned, both places were demolished. The tower at St. Patrick's Academy was of brick, laid entirely in Portland cement mortar, and the work was so well done the brick-work invariably broke through the bricks and not at

the joints; yet the tower was completely destroyed; in fact, it was the worst wrecked of all the buildings there.

The writers simply reiterate the statement that, speaking generally, buildings of brick walls and wooden interiors cannot be built which will not be wrecked in a severe shock, it being a fault of design and not of materials or workmanship.

The Fire Damage.

Any deductions from the fire must be those based upon a general conflagration, and not those of an isolated fire. In view of the complete destruction of all materials it becomes a question as to what should be done to make a building fireproof.

San Francisco was built probably in about the same way as other cities. It is an error to say that it was a wooden frame city, as the business district was generally composed of buildings with brick walls. In among these had been constructed the so-called fireproof structures, exposed on all sides to danger by the burning of the inflammable structures around them.

The only statement that can be offered is that the best insurance for buildings would be the isolation of a district containing nothing but fireproof structures. A general conflagration would then be impossible. Manifestly, this is impossible in San Francisco, where business must be resumed with the least cost. In many cities it would be good insurance for men owning large buildings to combine to buy out old and inflammable structures, either demolishing or rebuilding them. Otherwise, there remains the danger of general conflagrations, such as those at Baltimore and San Francisco, in which fireproof buildings will be injured from 30 to 60 per cent.

Turning to the individual building, the question of the exterior walls must be settled. There does not seem to be much choice of material. Architectural considerations demand the use of brick, terra cotta, or stone. With a steel frame supporting the walls at each story, any local fire will destroy the nearby facing, but it may be removed without damage to adjoining parts. This cannot be done when walls are self-supporting and the facing acts as a part of the wall. This risk of damage must always be carried, gradually becoming less as inflammable buildings are eliminated.

STEEL FRAMING MUST BE PROTECTED.

There is no doubt that the steel frame is adequate for all its purposes, but it must be protected. This brings up the general subject of fireproofing, in which is involved the construction of floors and partitions and ceiling and column protection. Where any reasonable protection was given the steel frames of buildings in San Francisco, the steel was uninjured, and hence the writers feel warranted in stating that it is possible to protect such a frame so that it will pass uninjured through a fire that consumes all parts that can burn.

It was stated previously that all materials were destroyed by fire; it follows, from this, that the destruction of fireproofing must be expected and that it will have to be restored after a fire. It becomes a question, then, of selecting the material that will stand up best, for the fireproofing must retain its form, even if destroyed.

In the writers' judgment, the column should be of a closed form, such as channels and plates. This is preferable to latticed columns. For columns, the fireproofing that will stand up best is red brick set in Portland cement mortar. Equal to this is a casing of solid concrete at least 4 in. thick, with a mesh of reinforcing metal. Examples were found in the St. Francis Hotel and Shreve Building, where the concrete was uninjured. In the Fuller Building, which was used as a paint and oil warehouse, the floors were of wood, and the columns were covered with from 4 to 5 in. of concrete. This protection held in place when the columns fell. It was completely destroyed, but the column shafts were protected. Next in order, and of equal merit as far as examples show, is the double wire lath and plaster protection, which, in the Wells Fargo Building, afforded complete protection. In many buildings, columns were protected by one layer of lath and plaster, directly applied, and

then the entire column, with pipes, &c., was enclosed by the regular partition. This afforded complete protection, and the Merchants' Exchange and Kohl buildings are examples. The examples of the Fairmount and Alexander hotels are not included, as obvious defects in design and execution warrant the statement that the columns in these buildings were practically unprotected. The same remark applies to the melted cast iron columns of the Sloan Building.

FAILURE OF TERRA COTTA TILE.

The remaining examples of column failures must be laid to the failure of terra cotta tile. The work in the Mills, Crocker and Aronson buildings was well done, but in all, and in the latter case especially, it failed utterly to afford complete protection. As the failure of one column section means the practical destruction of all floors supported by that column, the results are serious. In justice to the terra cotta tile, it must be said that in the St. Francis Hotel, the Union Trust and some other buildings it stood up well enough to protect the columns. The writers believe, however, that it is the least valuable of all materials commonly used for fireproofing.

For floor construction, some form of reinforced concrete is far preferable to tile. In all cases the record of concrete is better than that of tile. Connected with this is the protection of the lower flanges of beams and girders. The fire shows that a cover of lath and plaster directly upon the flange, protected again by the suspended ceiling, is the best. The layer of plaster alone on the flange will not protect. Neither will the thin piece of terra cotta strapped on. It may be stated here that one of the most obvious lessons taught by this fire is the protection to concrete floors and floor beams by the suspended ceiling of lath and plaster. In all cases where used it afforded complete protection. Where not used, concrete was destroyed and beams were distorted.

The subject of partitions is bound up with that of column protection. Terra cotta tiles are inferior to lath and plaster, although both were destroyed. A partition may be destroyed, but, if it stands, it impedes the spread of fire, and, in this light, the lath and plaster type is superior to tile. It should be possible to construct better partitions, but as yet no better ones have been offered.

ALL STRUCTURAL PARTS MUST BE FIREPROOFED.

A logical deduction from the statement that all materials were destroyed is the conclusion that all structural parts of a building, of whatever material constructed, must be protected by another material which will be a more or less complete loss in a fire. This applies to a steel frame, to floors of any type, and to roofs. It is impossible to protect some parts, such as fronts, partitions and other parts directly exposed. The floors and frame constitute the structural parts, failure of which means destruction of the building. All such should be fireproofed. This remark applies with equal force to buildings with reinforced concrete columns, girders, beams and floors. As integral structural parts, they should be fireproofed as well as similar members of a steel frame structure, for concrete is destroyed by fire nearly as quickly as steel.

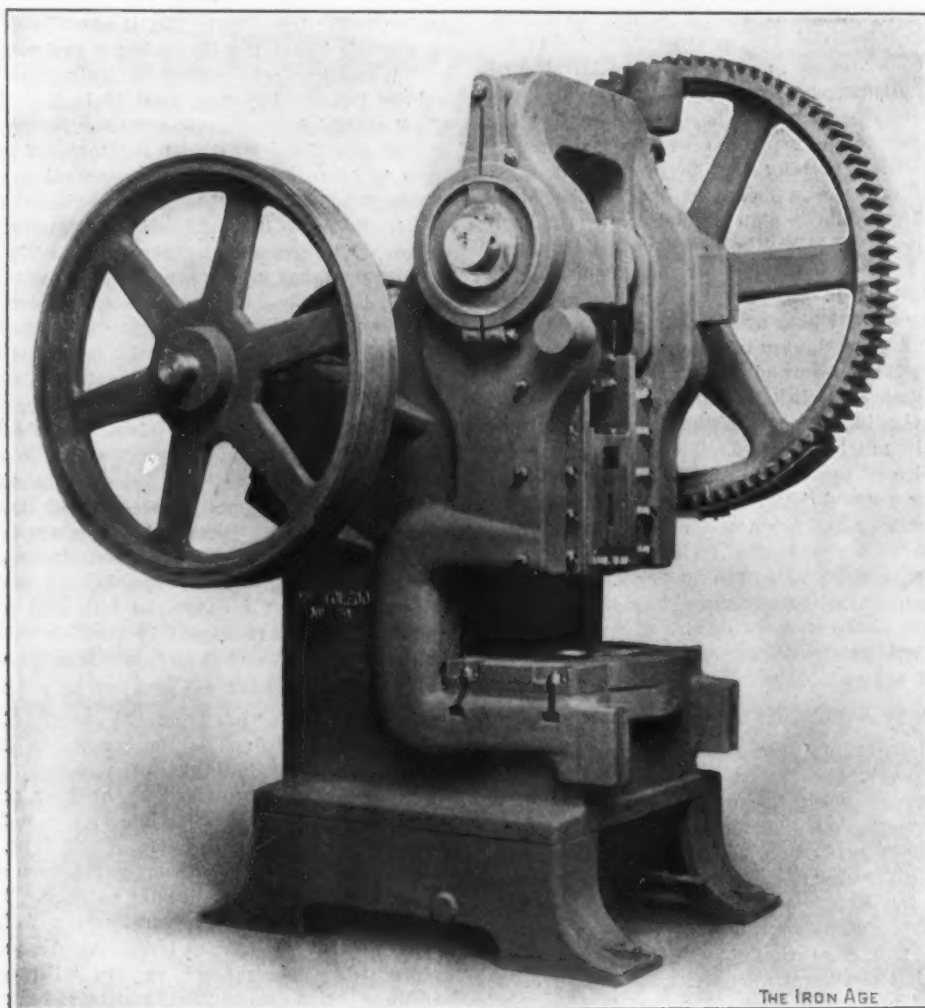
No further comment is offered, except the following: Buildings with wooden floors will be completely destroyed in a fire. Such parts as metal trim, wire glass and steel shutters were not used to sufficient extent to warrant any definite conclusions, except to say that what showing there was was favorable. Whether this expense is warranted was not determined. Bad work and indifferent construction will cause any material to fail. Good work will enable a poor material to stand up. Fireproofing should be continuous, and at no place should it be cut into for the passage of pipes, &c. The subject of pipes should be treated as it deserves, and proper ducts and shafts should be provided, instead of allowing them to be placed anywhere where they will give the least trouble.

The next annual meeting of the American Society for Testing Materials will be held at Atlantic City, N. J., June 20, 21 and 22, 1907.

A Powerful Toledo Blanking Press.

The making of large blanks or disks of heavy plate in considerable quantities has become so common that the single rotary slitting shears with circling attachments formerly used for the work are now considered too slow and presses with blanking dies are being used in their stead. The dies for this work necessitate powerful presses, with unusually large bed area and opening. The accompanying illustration shows a new size of geared press, capable of cutting large blanks of steel plate $\frac{3}{4}$ in. thick, which has recently been placed on the market by the Toledo Machine & Tool Company, Toledo, Ohio. It is stated to be much better adapted to the class of work previously mentioned than the solid back style of press

Ala. Five miles of railroad to reach the property, built from the main line of the Seaboard Air Line Railway, have just been completed. Shipments of ore will commence at once, and the output will be increased as rapidly as possible to the full capacity of the equipment, which is estimated to be 500 to 600 tons per day. The ore will be handled with steam shovels and crushed before washing. A modern four-log washer has been erected and with the usual accessories, including a large Gates crusher, will give facilities for handling as large an output as any individual brown ore mining operation in the State. The ore is of high grade, being notably low in phosphorus, and in this respect differs from the usual brown ore deposits in Alabama. About one-fifth of the output will be shipped to the furnace of the Central Iron & Coal Company, Holt, Ala., and the remainder to the



A Powerful Toledo Blanking Press.

formerly used and which necessarily had a very limited bed area and opening. The gap pattern is desirable for the convenience of the operator in feeding the heavy plates or bars from left to right in the rapid production of the work.

The machine has a stroke or slide motion of 2 in., which can be changed if desired. The adjustment of the slide is 4 in., and the distance from the bed to the slide in its uppermost position 13 in. The bed has an area of 28 in. front to back by 36 in. right to left, and an opening 16 in. front to back by 24 in. right to left. Between the housings the opening in the back is 24 in. wide and the distance from the back to the center of the slide is $8\frac{1}{2}$ in. The large gear is 61 in. in diameter and the ratio of gearing is $7\frac{1}{2}$ to 1. The balance wheel is 62 in. in diameter and weighs about 1300 lb. The machine complete weighs about 1850 lb.

Shook & Fletcher, Birmingham, Ala., have completed the development of their brown ore mines at Ohatchie,

Tennessee Coal, Iron & Railroad Company's Birmingham District furnaces.

One of the most unique undertakings now in course of execution is the Key West extension of the Florida East Coast Railroad. It starts at Miami and will run to Key West over a route 154 miles long, of which 74 miles will be on dry land, 25 miles on swamps and the remaining 55 miles over water and the long line of small islands which make up what are known as the Florida Keys. A feature of that part of the line which crosses water will be large reinforced concrete arches to carry the track far above the waves. There will be a temporary harbor constructed at Bahia Honda to handle the Cuban traffic, for which the road is intended, until the rails can reach Key West. Facilities at the latter point will be provided for handling the enormous ferryboats which it is proposed to run to Havana, 90 miles away. At Bahia Honda the jump across the water, from land to land, is about $8\frac{1}{2}$ miles. One other jump of nearly 5 miles will have to be made.

The German Tariff Negotiations.

The Effect of These Negotiations on Other Countries.

WASHINGTON, D. C., April 2, 1907.—Exporters and manufacturers having a large foreign trade appear to be greatly disturbed by the cable reports from Paris to the effect that the French Government resents the fact that the United States has entered into negotiations with Germany looking to a reciprocal arrangement of some kind, while refusing to ratify a reciprocity treaty with France. The press advices also intimate that other foreign countries are following the negotiations with Germany with a jealous eye, and it is intimated that conditions unfavorable to American products are developing in several European countries. Many inquiries have been received here as to the probability of retaliatory action upon American products, and it is apparent that these reports are generally accepted as well founded.

Erroneous Reports.

At the State Department these reports are characterized as having little or no foundation and as being based upon ignorance concerning the scope of the pending negotiations with Germany and the effect of any agreement that may be reached upon the commerce of other foreign countries. It is stated further that the French Government and the European governments generally, while greatly interested in the negotiations now pending between the United States and Germany, have a complete understanding of their purpose and are entirely satisfied with the outlook. American exporters need feel no anxiety so far as the effect upon other nations of an agreement with Germany is concerned, but on the contrary a satisfactory adjustment guaranteeing to American products the minimum rates of the new German tariff would probably result in obviating any difficulty with France or any other European country growing out of the recent rearrangement of foreign conventional tariffs.

Two Distinct Aims in View.

It is necessary to a correct understanding of the present situation to bear in mind the fact that the pending negotiations with Germany have in prospect two distinct aims: 1, The modification of the customs administrative regulations of the United States, both by Departmental order and by Congressional legislation; and, 2, the extension by act of Congress of the comparatively small list of articles enumerated in section 3 of the Dingley act, upon which reductions in duty may be ordered by the President in consideration of adequate reciprocal concessions. As the result of the visit of the North Customs Commission to Berlin, the Administration is now prepared to make a number of minor modifications in the customs regulations as soon as the pending negotiations are formally concluded. The most important changes desired by German manufacturers and exporters, however, can only be made by statute, but that satisfactory legislation will be enacted early in the new Congress there is now little doubt.

That this feature of the negotiations with Germany should be resented by the French Government is obviously absurd when the fact is borne in mind that every modification of the customs regulations, whether by executive order or by statute, will apply to the products of every country in the world sending goods to the United States, irrespective of whether a reciprocal trade agreement of any kind has ever been made with such country. A number of the concessions desired by Germany, especially with reference to the basis of invoice valuations, are of the highest importance to French exporters and no confidence is violated when the statement is made that the reluctance of the Treasury and State departments to meet the views of Germany in certain details is due more to the effect that the desired concessions would have upon our imports from France than upon those from Germany. As a matter of fact, therefore, all the countries of the world will benefit equally with Germany in any

modifications of the customs regulations that may result from the negotiations now on foot.

Application of Section Three of the Dingley Act.

A somewhat different situation exists with reference to the proposed extension of the reciprocity items of section 3 of the Dingley act. This very limited category now embraces only argols or crude tartar, brandies, and other spirits, champagne and all other sparkling wines, still wines and vermouth and works of art. The impossibility of securing the ratification of a comprehensive reciprocity treaty embracing reductions on a sufficiently large number of items of the United States tariff as to be regarded as a full equivalent for the German conventional schedules has induced the Administration officials to seek some other settlement of this phase of the controversy without entirely abandoning the reciprocity idea. It is therefore planned to ask Congress to add a number of items of more or less importance to those enumerated in section 3, with a view to establishing a basis not only for a new agreement with Germany, but for the negotiation of treaties with other countries.

Should Congress consent to this plan and enlarge the category of section 3, it would not be necessary to submit conventions negotiated thereunder to the Senate for ratification, and thus the Administration would be put in position not only to make a satisfactory adjustment with Germany, but to make concessions to other countries desiring reciprocal trade relations with the United States or the extension of those now enjoyed. In such an event France would probably be the first country to reap the benefits of the changes in the Dingley act, for although the European construction of the reciprocity principle is not accepted by the State Department to the extent that a concession made to any one country must be extended to all, yet in applying the principle to treaties negotiated under section 3 of the Dingley act, it has been uniformly held that the reductions therein specified may be demanded as a matter of right by any nation maintaining a maximum and a minimum tariff, provided the minimum rates are applied to products of the United States. It therefore follows that if the provisions of section 3 should be broadened all the treaties negotiated thereunder, including those with Germany, France, Italy, Portugal and Switzerland, would be automatically expanded to include all the new items added by Congress.

Scope of Concessions.

It should be carefully noted, therefore, that while any changes in the customs administrative laws and regulations would apply to importations from all countries, any additional concessions in the tariff rates under section 3 of the Dingley act would be granted only to those countries with which we have already concluded reciprocity treaties or with which we may hereafter conclude such conventions. It will be understood, of course, that only those countries would be entitled to the proposed tariff concessions which grant to products of the United States the rates of their minimum schedules.

W. L. C.

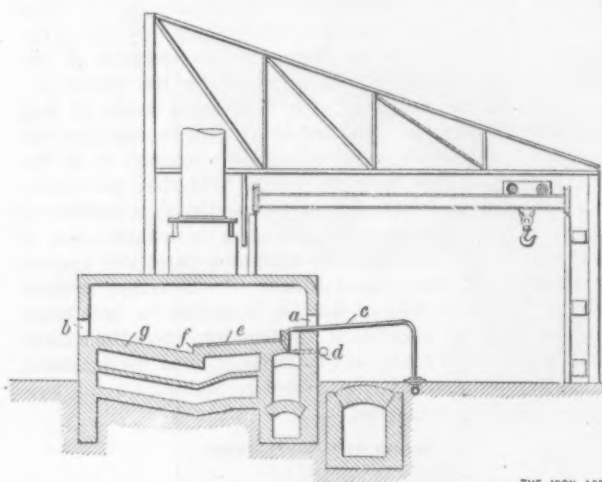
The R. C. Foster Company, Philadelphia, Pa., opened an office in November, last, in rooms 1004-1005 Brown-Marx Building, Birmingham, Ala. The company is the southern representative of the Eastern Steel Company, Pottsville, Pa., and the Milton Mfg. Company, Milton, Pa. It also conducts a business in the sale of pig iron and bar iron, as well as handling scrap iron and steel. In addition to operating scrap yards at Augusta and Savannah, Ga., the company contemplates opening a large scrap yard at an early date in Birmingham, which will be equipped with appliances for handling and breaking up large and heavy pieces.

As the result of the recent trip of Cleveland manufacturers to Mexico good sized orders for their products have been secured from Mexican consumers by the Warner & Swasey Company, the National Screw & Tack Company, the Republic Belting & Supply Company, the Eberhart Mfg. Company and the National Carbon Company.

A Method of Heating Sheet Packs.

To render the labor attending the heating of metal packs less arduous and less expensive, an improvement has been introduced by the American Sheet & Tin Plate Company in accordance with a patent recently granted to Charles W. Bray, Pittsburgh, president of the company. The ordinary procedure is to feed metal packs into the reheating furnace and withdraw them through one and the same opening. This requires skilled labor both for feeding and taking out the packs and there is liability of chilling packs already heated. In addition the piling up of packs at the opening interferes with the operation and causes a trying temperature for the workmen. The arrangement devised by Mr. Bray, as shown in the illustration, provides a rear opening, *a*, for feeding in and a front opening, *b*, for withdrawing. Water cooled supports, *c*, extend through the opening *a*, and are bent down and back to the outlet pipe *d*. Continuous water circulation is thus maintained. The bottom of the furnace inclines slightly from the rear toward the front and the rear portion *e* ends in a shoulder, *f*.

In the reheating operation the piles of packs are carried by the overhead crane and deposited upon the water cooled supports at the rear of the furnaces. They may be fed in through the opening *a*, either as piles or as separated packs. On the front portion of the furnace bottom the piles will be separated, each pack lying by itself, and in some cases the sheets of the pack may be



A Method of Heating Sheet Packs.

separated from each other. If a heater separates the sheets of a pack during heating he can again assemble them before drawing out the pack. Experience shows that the speed of finishing mill operations is increased and thus the unit of cost is decreased. A skilled heater is not required for the work of feeding in and the packs fed in are not liable to chill those which have been brought up to the proper temperature. In addition, the heating operation is speedy and continuous.

A New Rail Mill at Ensley.—The Tennessee Coal, Iron & Railroad Company, in carrying out its plans for enlarging its plant at Ensley, Ala., which were outlined in these columns several months ago, has found it desirable to make a substantial addition to its rail mill capacity. The company has placed an order for a mill, with a capacity of 2000 tons of rails a day, with the United Engineering & Foundry Company, Pittsburgh. The new open hearth furnace construction announced several months ago provides for a sufficient production of raw steel to keep the new mill busy. The present rail mill engine will be ample for the operation of the new mill.

The American Car & Foundry Company, at Binghamton, a suburb of Memphis, Tenn., is doing good work. In January and February 17,000 completed cars were turned out. At the beginning of March the company had orders ahead for 87,000 cars.

Smoke Prevention in London.

In an article in the *London Times' Engineering Supplement* J. Swinburne refers to the results of antismoke legislation in London and the methods adopted for gauging the blackness of smoke issuing from offending chimneys.

According to the Public Health act no one may emit smoke from a useful chimney in London, or, at any rate, not much smoke. Any one may emit as much smoke as he likes from his private house, but a furnace used for trade must consume its own smoke, under a penalty not exceeding £5 for the first offense, £10 for the second, and so on in geometrical progression. An important factory is thus absolutely at the mercy of the magistrate, for if there is a conviction, say, once a week for a year the fines would soon reach a wholly prohibitive sum. The act is not inflexible, however, since it goes on to say, "the words 'consume or burn the smoke' shall not be held in all cases to mean 'consume or burn all the smoke'"; and if the person has consumed as much smoke as he could possibly consume the fine may be remitted. The person may also be liable for nuisance if his furnace does not as far as practicable consume its smoke, or he may have to answer for his chimney "sending forth black smoke" in such quantity as to be a nuisance. The law, with its threatening possibilities in the way of fines, has done an immense amount of good. The result is that engineers have discovered how to reduce smoke to a minimum, and it is difficult to find a factory chimney which gives any smoke that could do any perceptible harm.

Cases arise, however, in which the degree of the offense of manufacturers whose chimneys smoke must be determined, and it has been difficult to get witnesses to agree as to the density of the smoke emitted. To meet such cases smoke charts have been designed. The person complaining of the smoke of a given chimney takes the smoke chart, which shows a series of squares, beginning with nearly white paper and ending with black, and tries to compare the smoke with the squares. These squares are numbered, and thus two witnesses, representing opposing sides, can have similar charts and find room for disagreement only as to which square fairly represents the blackness of the smoke. The Institution of Civil Engineers has issued a smoke chart in connection with the report of its Committee on Steam Engine and Boiler Trials. This system is imperfect because it is almost impossible to compare smoke seen against the sky with a shade on paper which is not only in close proximity to other darker and lighter shades, but is not really comparable at all. This difficulty may be overcome by having the smoke scale on glass or celluloid, so that it can be held up and the smoke compared with the different squares. It is then easy to say definitely with which tint the smoke at any given moment corresponds approximately.

The drawback that different observers may not match the smoke and the scale similarly can be overcome by eliminating the observer's judgment and photographing the smoke. To photograph the smoke in the ordinary way would be quite useless as a record, because the appearance of the smoke in the resulting print would depend on the kind of plate used, whether it is slow or fast; whether it is isochromatic and used with or without a screen; how far it is developed, and whether the negative is intensified. Then the print may be on a print-out paper giving great contrast, or on a platinum one, or a bromide paper may be used properly exposed and fully developed, or overexposed and incompletely developed. Most of these sources of error can be avoided by photographing the smoke scale with the smoke. They then both receive the same treatment, and the smoke on one print is compared not with the smoke on another print, but with its own smoke scale. Thus smoke on one print may be very light, the scale being very light, too, so that the smoke corresponds with the scale at, say, 0.4, which means that the smoke stops four-tenths, or 40 per cent. of the light. On another print taken by some one else at the same time the smoke may look very dark, but the scale will look very dark, too, so that the smoke will still correspond with the part of the scale marked 0.4.

The Manufacture of Aluminum.

The following interesting article is taken from the current issue of the *Bulletin* of the American Iron and Steel Association.

One of the newest and most interesting industries of this country is the manufacture of aluminum, which is used in the production of domestic and other articles, including machinery that combines lightness with strength, as an alloy with steel and other metals, and largely for the transmission of electric currents as a substitute for copper. Fifty years ago aluminum was a chemical curiosity. Soon afterward small quantities were produced in Europe for commercial purposes by various processes, but the production abroad did not enter largely into the arts until after the manufacture of aluminum on a large scale was developed in the United States through the invention in 1886 of the electrolytic process by Charles M. Hall, a native of Thompson, Geauga County, Ohio. This process is now in universal use, and it is exclusively used in this country.

In a report of the United States Geological Survey for 1892 the statement was made that "practically all the pure aluminum which has been made in the United States has been made in accordance with the electrolytic process covered by Hall's patents." Mr. Hall's process has so reduced the cost of aluminum that the metal is now in common use. The production in the United States in 1883, before Mr. Hall's invention, was only 83 lb., a purely laboratory product, but in 1903 it amounted to 7,500,000 lb., and in 1905 the consumption of aluminum in the United States was 11,347,000 lb. The production has since phenomenally increased.

The Pittsburgh Reduction Company.

In August, 1888, the Pittsburgh Reduction Company was organized solely to manufacture aluminum under Mr. Hall's patents, and works for this purpose were built in that year at Pittsburgh and put in operation in November. The name of the company has recently been changed to the Aluminum Company of America. It is the only company in the United States that is engaged in the manufacture of aluminum. The works at Pittsburgh were located on Smallman street, between Thirty-second and Thirty-third streets, with the Carbon Steel Company's office on one side and the Union Iron Mills of Carnegie Brothers & Co. on the other side. In 1890 these works were greatly enlarged, and in the following year they were moved to New Kensington, a suburb of Pittsburgh, and again enlarged in 1893. They are still in active operation. Other works now operated by the company are located at Niagara Falls, at Massena, St. Lawrence County, New York, and at Shawinigan Falls, Province of Quebec. The first works at Niagara Falls were started in 1895, and in 1896 they were enlarged and new works were built.

Alumina made from Greenland cryolite was used at first by the Pittsburgh Reduction Company in the manufacture of aluminum, but very soon bauxite from Alabama and Georgia was substituted and its use has produced the best results. The bauxite is to-day purified at works at East St. Louis, Ill., owned by the Aluminum Company of America, and thence taken to various manufacturing plants of the company and converted into pig aluminum. In 1896 the manufacture of pig aluminum at New Kensington was abandoned. The works at that place have since been devoted to converting pig aluminum into more or less finished forms. In late years these works have been greatly enlarged.

Pittsburgh Interests in the Business.

The first president of the Pittsburgh Reduction Company was the widely known Pittsburgh engineer, Capt. Alfred E. Hunt, who remained its president until his death in 1899. The original capital subscribed was Pittsburgh capital, and the business was entirely a Pittsburgh enterprise. Mr. Hall went to Pittsburgh in 1888, when the company was organized, and has been identified with it ever since, at present being vice-president. Since Captain Hunt's death R. B. Mellon, the well-known banker of Pittsburgh, has been president of the company, and Ar-

thur V. Davis, its secretary and general manager, has been its active executive head. The original capital was \$20,000; the present capital is \$3,800,000.

When first put on the market aluminum was used only in the manufacture of optical instruments, dental plates and similar light articles. In 1890 the manufacture of aluminum cooking utensils was commenced. One of the earlier uses of aluminum was as an alloy in the manufacture of steel, aluminum being added to the extent of one-tenth of 1 per cent., or less, to remove the dissolved gases and make the steel solid both for castings and for steel plates. It is so used to-day.

The Price Greatly Reduced.

Prior to Mr. Hall's invention in 1886 the price of imported aluminum in our markets was not less than \$15 per pound. In 1888, when the works of the Pittsburgh Reduction Company were started, the price of imported aluminum dropped to \$4 per pound. A short time previously the price had been \$7 and \$8 per pound. The Pittsburgh Reduction Company soon reduced the price of aluminum to \$2 per pound, and in 1893 the price ranged from 65 to 75 cents per pound. In 1907 it is 43 cents.

The establishment of the aluminum industry in this country 20 years ago by the Pittsburgh Reduction Company has not only given to our country a new and useful industry, but, as has been shown above, it has greatly reduced the price of aluminum to consumers, again illustrating the truth, which has been so often emphasized, that prices of manufactured products always fall when we cease to be dependent on foreigners for their supply. The manufacture of aluminum is to-day one of the important and necessary industries of this country, and for its existence we are indebted first to Charles M. Hall, the inventor of the electrolytic process, and next to the engineering skill and executive ability of Capt. Alfred E. Hunt.

The Bucyrus Steel Casting Works.—The Bucyrus Steel Casting Company, Bucyrus, Ohio, commenced operations in its new open hearth steel plant on March 13 with a daily capacity of 60 tons, which, owing to extensions now under way and to be completed by August 1, will be doubled to 120 tons per day. The foundry measures 160 x 305 ft., with a 65-ft. span in the main building and a 45-ft. span in each lean-to. The basic furnace is equipped for either oil, natural gas or producer gas. At present oil is being used for fuel purposes. The foundry is also equipped with three Niles cranes, one 10-ton in each lean-to and one 25-ton in the main bay. The company also uses pit annealers. Power is supplied by two 300-hp. Bass boilers, two 250-kw. Fort Wayne Foundry & Machine Company's generators, two 250-hp. Bass engines, Corliss type, and one Ingersoll compressor, with a capacity of 800 cu. ft. of air per minute. The first heat, being product for the Bass Foundry & Machine Works, Fort Wayne, Ind., and James Lefell Company, Springfield, Ohio, proved eminently successful. The company at present gives employment to 100 men, and the officers are P. J. Carroll, president; Frank P. Donnenwirth, vice-president; W. A. Blicke, secretary and treasurer; Chas. E. Lyon, manager of works, and Joseph Hanmer, superintendent.

Large stock piles of manganese ore of a value reported to be nearly equal to that of the entire Indian wheat crop are said to be piled alongside certain railroad lines in India waiting for cars to take them to the seaboard for shipment to Europe and the United States. Deputations of Indian railroad officials and representatives of important trade interests recently waited upon the British Secretary of State for India to urge that measures be taken to remedy the conditions resulting from serious and long continued shortage of rolling stock on the railroads of India. The criticism is made that while the budget grants for these railroads have been increasing there has been no adequate provision for increasing rolling stock requirements; that while £2,500,000 was voted for the current fiscal year two or three times that amount would have been nearer the mark.

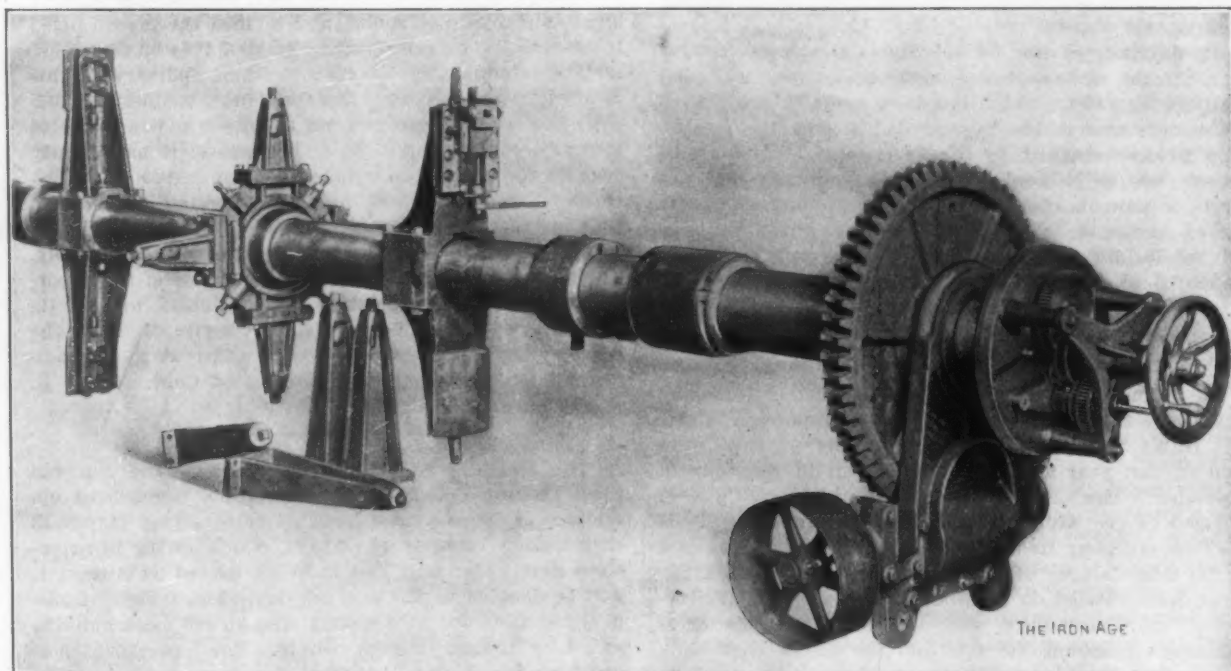
A New Underwood Portable Boring Bar.

The use of portable power tools on large, heavy castings or assembled pieces of machinery that it would be impracticable to machine on stationary tools opened up a field of remarkable possibilities, and many interesting equipments for such work have appeared from time to time. The tool illustrated is a portable boring bar, built by H. B. Underwood & Co., Philadelphia, Pa., for boring the casings of steam turbines, grooving them for the inserting of the stationary blades, truing up the blades after they are inserted, and when necessary grinding them while the bar remains in place. An idea of the size and power of the tool may be had from the dimensions of the bar, which is 10 in. in diameter by 27 ft. long, and is made of a solid steel forging.

The bar is driven by an Albro-Hindley worm, and a worm wheel is provided with a feeding mechanism at one end, which affords three changes by manipulating

eters. The two end sections contain the shaft bearings, and in one of them there is a manhole. The sections are machined before being assembled, being rough bored and the flanges faced. They are then bolted together, making a long cylinder of varying diameters. After the bar has been introduced into this long cylinder the bar bearings are accurately set in the outer shaft bearings, and the cutter heads and center bearings are passed through the manhole and are mounted together on the bar, preparatory to boring and grooving.

After the boring is done each cylinder has several $\frac{3}{8} \times \frac{3}{8}$ in. grooves turned in its interior. The slide rest for the grooving tool is shown in the illustration on the upper end of the cutter head. On the lower end of the same cutter head is shown a place to attach a grinding wheel when a ground finish is required. The small solid cutter head shown is used for the boring and grooving of small cylinders. The tools on all of the cutter heads and steady bearings are arranged so as to be



A New Underwood Portable Boring Bar.

a sliding shaft. A rapid feeding movement is obtained by the large hand wheel, which changes the position of the cutter heads quickly and is used in starting a cut. After that the hand wheel is blocked and the automatic feeding continues.

The bar illustrated is fitted with three cutter heads; the two larger ones are made in halves, so that they may be mounted on the bar after it is inside of the cylinder. Similarly the steady rest spider is made in halves for the same reason. The latter has adjustable arms for different diameters of bore. The small cutter head is in one piece and is placed on the bar by being previously placed in the cylinder and the bar slipped through it.

The feed screw is on one side of the bar and carries a nut, the sole function of which is feeding the tools during cutting. On the opposite side of the bar is a keyway in which slides the key for receiving the side thrust due to the cutting. It is long and of sufficient size to make an easy guide, and receives the strain on the feed nut.

The bearing for taking the end thrust of the screw while feeding is in progress is made of hard bronze and has several grooves cut in it which fit on corresponding collars on the screw. The bearing is very substantial and well adapted to take the thrust attending deep or heavy cutting.

The reason for making the two-arm cutter heads in two pieces for this particular bar was that the cylinders it was to be used in are cast in sections of various diam-

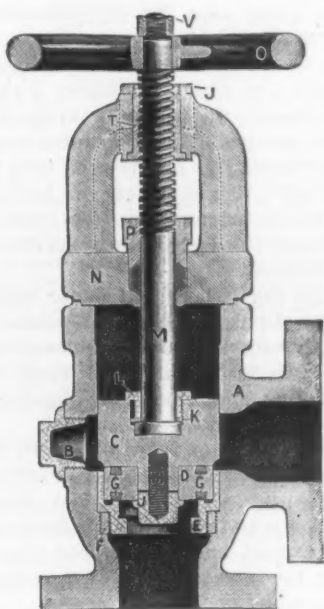
eters. The two end sections contain the shaft bearings, and in one of them there is a manhole. The sections are machined before being assembled, being rough bored and the flanges faced. They are then bolted together, making a long cylinder of varying diameters. After the bar has been introduced into this long cylinder the bar bearings are accurately set in the outer shaft bearings, and the cutter heads and center bearings are passed through the manhole and are mounted together on the bar, preparatory to boring and grooving.

Hydro-Electric Development in Brazil.—What is recognized as a most important step in the development of South America is the fact that the Government of Brazil has just granted permission to Guinle & Co., of Rio de Janeiro, to sell electricity in the capital city as well as other important cities in the republic. The contracts for light and power in Niteroy and other cities along the proposed transmission lines have already been let. The initial electric power sources will include several hydro-electric stations just being completed on various water falls controlled by Guinle & Co. These have an aggregate capacity of some 50,000 hp. The electrical equipment was furnished by the General Electric Company, New York. It is expected that work on the transmission lines will be started next June.

The Rhode Island Metal Trades Association was organized at a meeting held at Providence, March 25, at which a large number of representative manufacturers in the metal industries were present. The purposes of the organization are the encouragement of the open shop, better acquaintance among the members and any other objects that will promote better industrial conditions and protection for both employer and employee. J. H. Cone, assistant secretary of the National Metal Trades Association, addressed the meeting. The details of organization are not yet ready for announcement.

The Duro Blow-Off Valve.

An improved design of blow-off valve, which has been given the trade name Duro by the manufacturer, the Lunkenheimer Company, Cincinnati, Ohio, is shown in section in the accompanying illustration. In its design it has been the aim to overcome the tendency in blow-off valves, as heretofore made, for sediment and scale to lodge on the seat and be caught between it and the disk, soon cutting the bearing surfaces so that the valve would become leaky. Many schemes have been tried to prevent this, a common one being to fit the disk tightly in the valve body, so that scale could not pass to the seat after the disk had passed and cut off the inlet. This proved to afford but temporary relief from the trouble, for as soon as the valve became worn it permitted the scale and sediment to pass. In the valve illustrated these defects, it is claimed, have been overcome. The plug fits snugly



The Duro Blow-off Valve Made by the Lunkenheimer Company, Cincinnati, Ohio.

in a separate and easily removable bronze casing, which can be readily replaced when worn. Any accumulation of scale or sediment that might remain on the seat before the disk is brought in contact with it is washed away by the water which passes around the plug while the latter is seating.

In the sectional view it will be seen that the plug C, which is guided in the valve body A, carries a reversible, double-faced disk, D, secured to it by the stud H and the nut J. The bronze seat ring E is screwed into a second brass ring, F, making it possible to renew E very easily when it becomes worn. At the back of the valve is a plug, B, through which a rod may be introduced to clean out the blow-off pipe. The stem M raises and lowers the disk C, which is held to it by the lock nut L, the latter being prevented from unscrewing by the nonrotating washer K. The threads of the stem M operate within a removable bronze bushing, T, on the top of the yoke.

It will be seen that all parts of the valve have been so designed that they can be easily renewed when worn or broken. The disk D, having two Babbitt faced bearings, G G, can be replaced at small cost, or the old Babbitt can be melted out, new poured in and when the disk is refaced it is as good as new.

The Duro valve is closed by screwing down the disk in the usual manner and as the edge of the disk enters the cylindrical extension of E any scale or sediment which might pass is cut off. As the disk D continues to approach the seat E the leakage of water around it washes off any scale or sediment which might have accumulated there, and when the disk is perfectly seated no scale or sediment can remain between the contact surfaces.

Power Plant Efficiencies.

In a paper covering the efficiency of an electrical generating plant operated by steam an English engineer has made comparisons between the electric plant and two ships of the British Navy tried in 1904. The comparison shows that the battleship Commonwealth developed 12,797 i.h.p. (68 per cent. of full power) with a coal consumption of 1.67 lb. per unit per hour, the steam consumption being 16.77 lb., thus showing 10 lb. of water evaporated per pound of coal. The cruiser Diamond developed full power (10,066 i.h.p.) on coal and water consumptions of 2.98 and 21.6 lb., respectively, per unit, this accounting for 7.25 lb. of water evaporated by each pound of coal. At the Grimsby electricity works a load of 211 kw. (24 per cent. of full load) was carried on a coal consumption of 7.1 lb. per kilowatt hour, the steam consumption of 46.6 lb. indicating an evaporation of 6.57 lb. of water per pound of coal. In order to render the comparison effective it was assumed that the ship's engines were applied to the driving of dynamos, the overall efficiency being taken at 85 per cent. On this basis the battleship, cruiser and stationary plant furnished power as follows:

	Per kilowatt hour.	
	Coal.	Water.
Battleship	2.66	26.6
Cruiser	4.7	34.1
Grimsby plant.....	7.1	46.6

It is pointed out that, inasmuch as the warships were using picked Welsh coal, while the shore plant was using fine slack, the showing of the latter should appear much better than the figures would indicate. For instance, the evaporation of 6.57 lb. of water per pound of slack is said to be every bit as good as the cruiser's figure of 7.25 lb. with Welsh coal. It may be said in this connection that the two ships selected for this comparison made, respectively, the best and the worst records of all those tried during 1904. The author of the paper doubts if any electric power plants can compete in general efficiency of steam consumption with the best results obtained in ships. This stand seems to be at variance with the usually accepted ideas on the subject, for all plants which are mobile, such as those on ships and locomotives, are of necessity designed with large regard to a saving in both space and weight, both of which requirements are in large measure detrimental to the obtaining of best economy.

The Worcester Polytechnic's New Building.

The new electrical engineering building of Worcester Polytechnic Institute, Worcester, Mass., which is to be completed this fall, and which will be the largest one of its kind in the country, costing over \$125,000, is to be equipped with a complete heating and ventilating outfit supplied by the Green Fuel Economizer Company, Matteawan, N. Y. The general laboratory is 200 ft. long by 50 ft. wide, containing three galleries, and has 19,400 sq. ft. of floor space and about 400,000 ft. of cubic contents. Besides this, there will be in the west wing a lecture hall for seating 300 persons, above which will be standards and research laboratories, while the east wing will contain a library and offices, designing rooms, blue print rooms and recitation rooms.

The equipment for supplying warm air to this space will consist of a Green cone fan, 6 ft. in diameter, drawing the air through a tempering coil consisting of six Green heater sections, each containing 2544 lineal feet of pipe. The air from the fan can pass either directly to the room or through another heater consisting of four sections and containing 2640 lineal feet, or part of the air may be passed one way and part the other and the two volumes of air mixed in suitable proportions to regulate the temperature. The heaters are of a new design, being made up of straight pipe expanded into headers. By removing the covers of the latter any pipe can be inspected, cleaned or removed. As circulation is positive, the heater cannot become air bound. It is adapted for live or exhaust steam and hot or cold water.

Motor Auxiliaries to Railroad Service.

In furthering its policy of adopting to its uses all modern improvements, the Pennsylvania Railroad appointed last fall a committee of officials, composed of C. M. Sheaffer, superintendent of passenger transportation; R. N. Durborow, superintendent of motive power, and A. E. Buchanan, chief clerk to the general passenger agent, to visit Europe for the purpose of studying general railroad conditions, and the operation of road and rail motors, especially with reference to the possible adaptability of the American use of road motor cars as auxiliary to the regular passenger service. This committee has just submitted its report to the general manager. Regarding road motors, which are operated over ordinary roads by railroad companies from their stations to outlying villages, the report says:

Road Motors.

"The road motors for passenger service are simply automobile omnibuses of various types, the cost varying from \$3000 to \$5000, some of them having double decks, and in many cases small compartments for the accommodation of luggage and parcels. Machines of this character have been introduced to a greater or less extent by the following: London & Northwestern Railway Company, Great Western Railway Company, London & Southwestern Railway Company, Great Eastern Railway Company and Caledonian Railway Company.

"Frequent road motor service has been established at points where there are villages not located on the railroads, but with sufficient population to warrant the service, also from stations on the main line, as well as from the terminus of one branch line to that of another. These motors are operated on advertised schedules, at a maximum speed of 15 miles per hour. The routes covered range from 3 to 20 miles in length, and the tariff rates for passengers, luggage and parcels are published, no distinction being made as to class. A storekeeper in each village is employed as the agent for the company.

"The established schedules are maintained with a fair degree of regularity; the service is well patronized, and is appreciated by those depending upon it. However, the committee failed to find, at any of the places visited, very much enthusiasm expressed in regard to the road motor proposition from a railroad standpoint, some of the railroad officials stating that they did not consider this character of service a proper function of a steam railroad company. In some cases negotiations were under way with independent automobile omnibus companies to take over and operate the road motor service; and, further, we failed to find any road motors in operation or contemplated in connection with any of the Continental railroads.

"The Great Western Railway of England, on account of the numerous small towns and villages adjacent to its lines, is the largest user of road motors, owning 84 machines and operating them on 44 established lines. We inspected the service between Slough and Stoke-Poges, a distance of 10 miles the round trip. The car used was equipped with a four cylinder gasoline engine of the Milnes-Daimler type, and had a carrying capacity of 20 persons. Steam road motors have been tried on this line, but were unsuccessful on account of boiler troubles, and they have been abandoned.

"The Great Eastern Railway has 18 motors—four Daimler, two Wolsely, two Thornycroft and 10 built by themselves. The cars have double decks and each seats 38 persons. The Caledonian Railway of Scotland has two road motors in service a few miles from Glasgow, between Clarkston and Eaglesham, a distance of 8 miles.

"From our personal observation and the information obtained as to the conditions existing under which road motor service has been established and operated in Great Britain, and with our knowledge of the general condition existing in the territory traversed by our line, it is the opinion of the committee that the establishment of this character of service as an adjunct to our railroad passenger business is not worthy of any serious consideration at this time, and it is our judgment that the same cannot be successfully or profitably operated, on account

of the general bad condition of the roads, severe climate and the territory not at present covered by trolley lines being so sparsely settled as to make such service unnecessary and unwarranted."

Regarding rail motors, operated directly on the tracks of railroad companies, the report says:

Rail Motors.

"Rail motors, costing from \$8000 to \$10,000 each, have been introduced to a greater or less extent by all principal railroads of England, also by several on the Continent, as follows: Great Western Railway, London & Northwestern Railway, London, Brighton & South Coast Railway, London & Southwestern Railway, Great Central Railway of England, German Government Railways (Saxony), Italian State Railways, Paris, Lyons & Mediterranean Railway, and Paris & Orleans Railway Company.

"In some cases these rail motors have entirely displaced the steam passenger service on branch lines, but are generally being used for supplementary service in connection with other trains.

"The car is equipped with a small compartment on the rear platform in which are placed a throttle connection with the boiler, the necessary brake apparatus and whistle, which permits it to be operated from either end, making it unnecessary at any time to turn the car. The design and construction of the car are such as to make it unsuitable for shifting purposes. On lines where motor cars are operated the freight train service is performed by a regular locomotive.

"It appears that where rail motor service has been established travel has increased to a considerable extent. Within itself, the service is not remunerative, but the expense would seem to be warranted when its value as a feeder in creating additional long-distance travel from the main line steam trains is considered.

"Operating officials of roads on which this character of service has been established were rather enthusiastic as to its possibilities. The mechanical officials, however, were not favorable to it. It was admitted that there is a slight saving in fuel, but it is claimed that this is more than offset by the increased cost of maintenance and the loss of service while undergoing repairs.

"The London, Brighton & South Coast Railway has small detachable steam locomotives at Brighton, which are attached to trailers. Local officials said this service was more satisfactory than by the gasoline cars. The London & Southwestern Railway has 14 steam rail motors from its Marylebone Station, London.

"German railroads, under Government management, have been experimenting with rail motors two years, using for purposes of comparison a Serpollet car (steam, with coal fuel), a Milnes-Daimler car (gasoline), and an accumulator car (storage battery), also a small locomotive and coach. We were told that the experiment so far showed the steam locomotive and coach to be the most economical and successful.

"With the benefit of this experience the committee is of opinion that the installation of self-contained motor cars for passenger service on certain branch lines largely depends upon the gradients, the possibilities for increased travel and the possible saving from a reduction in the train crews. A small tank locomotive and car, equipped for operation in either direction without turning, commends itself as the most elastic adaptation of the rail motor which came under our observation and appears to be in the line of future development abroad."

The report of State Geologist E. R. Buckley of Missouri for 1905 gives the production of iron ore in that year as 109,398 tons, valued at \$330,000. The consumers were the Sligo Furnace Company, producing charcoal iron, and the St. Louis Blast Furnace Company, producing coke iron. New interest was taken in opening iron ore properties. The red hematite ore at Mudville was explored to a depth of 100 ft. And in the area tributary to Greenville the report says that several million tons may be made available. It is stated that the next few years will undoubtedly show increased iron ore production in Missouri.

A Bankrupt's Life Insurance.

WASHINGTON, D. C., April 2, 1907.—The United States Supreme Court has handed down a decision that a bankrupt may withhold from his trustees any life insurance policies held by him upon payment of the "cash surrender value" thereof as estimated by the company issuing the policy, without regard to whether such surrender value is provided for in the policy or not. The decision will enable business men to protect themselves and those dependent upon them, while at the same time surrendering to their estates a fair proportion of the value of such insurance as they may carry.

The case ruled upon by the court is that of *Hiscock, Trustee, vs. Mertens*. The question before the court was whether the cash surrender value of a policy of insurance under section 70 of the Bankruptcy act must be provided for in the policy, or whether it be sufficient if the policy have such value by the concessions or practice of the company. Section 70 provides that

The trustee of the estate of a bankrupt upon his appointment and qualification . . . shall be vested by operation of law with the title of the bankrupt as of the date he was adjudged a bankrupt, except in so far as it is to property which is exempt, to all (1) documents relating to his property, . . . (3) powers which he might have exercised for his own benefit, but not those which he might have exercised for some other person, . . . (5) property which prior to the filing of the petition he could by any means have transferred or which might have been levied upon and sold under judicial process against him; provided, that when any bankrupt shall have any insurance policy which has a cash surrender value payable to himself, his estate or personal representatives, he may, within 30 days after the cash surrender value has been ascertained and stated to the trustee by the company issuing the same, pay or secure to the trustee the sum so ascertained and stated, and continue to hold, own and carry such policy free from the claims of the creditors participating in the distribution of the estate under the bankruptcy proceedings, otherwise the policy shall pass to the trustee as assets.

Policies Claimed by Trustees.

The respondent and his sons, individually and as composing the copartnership of J. M. Mertens & Co., were declared bankrupts, and the petitioner was elected the trustee of their estate. At the time the petition in bankruptcy was filed Mertens held four life insurance policies issued by the Equitable Life Assurance Society of the United States. One of the policies, payable to his wife if she should survive him, is not involved in this controversy. The other three policies were payable to Mertens at his death, his executors, administrators or assignees. A dispute arose as to the ownership of these policies and the trustee filed a petition in the district court for the determination of the ownership of them, and that Mertens be required to make an assignment of them to the trustee. Mertens answered, alleging that the policies had by law and the regular practice of the Equitable Life Assurance Society a cash surrender value which he had sought to pay to the trustee, and was ready and willing to pay; that it was the uniform practice of the society to pay, upon the surrender of such policies, the cash value thereof, "determined in accordance with a fixed and definite method of computation, and stated on demand by any policyholder or person in interest."

In the proceedings that followed it was shown, first, that the policies in question did not specifically provide a "cash surrender value," and, further, that the company issuing them paid their surrender value only after six months from the date of nonpayment of a premium. On this showing the district court sustained the contentions of the trustee, and an order was entered requiring Mertens to assign the policies for the benefit of his creditors. From this decision Mertens appealed, and the Circuit Court of Appeals reversed the court below. The Supreme Court now confirms the Court of Appeals, holding that section 70 of the Bankruptcy act expresses no distinction between the cash surrender value of a life insurance policy based upon contract and that based upon the usage of insurance companies. The decision in part is as follows:

"What possible difference could it make whether the surrender value was stipulated in a policy or universally recognized by the companies? In either case the purpose

of the statute would be subserved. . . . It is further contended that respondent has not made out that the policies have a cash surrender value, because it appears from the evidence that the company would not accept their surrender until they had lapsed, and that they had not lapsed either when the petition was filed or the bankruptcy adjudged. But this is tantamount to saying that no policy can ever have a surrender value. According to the testimony, policies which have a stipulation for such value are subject to the same condition. And there is nothing in the record to show that the practice and policies of other companies are not the same as those of the Equitable Life Assurance Society."

W. L. C.

New Publications.

Steam Turbines. By Carl C. Thomas, Professor of Marine Engineering, Sibley College, Cornell University. New York: John Wiley & Sons; London: Chapman & Hall.

Standard works on the steam turbine are becoming numerous, and, as might be expected from the fact that the whole subject is still relatively new and the data available are at the command of all for whom it has interest, the differences in the methods of treatment are not conspicuous. Professor Thomas has made to this growing literature a contribution which is both interesting and valuable; but being written from the viewpoint of the professor it is to some extent elementary, as it should be. Nevertheless, it leads the reader into a sphere of the higher mathematics, where, unless fresh from the classroom, he may find difficulty in following. Much of the experimental data in the work was obtained from Professor Gutermuth of Darmstadt, Dr. Stolda of Zurich, George Wilson of Manchester, and Professor Rateau of Paris. The work on nozzles and buckets, which is of value, was done in the laboratory of Sibley College, where experiments are now in progress which promise important additions to our knowledge of the possibilities of the turbine.

The historical portion of the book is somewhat meager, but the analysis of the several types of turbines and their operation is thorough, conscientious and valuable. The steam engineer will find it a useful handbook, in which is presented the solution of many problems he would find it difficult to work out for himself. It is not intended to have popular interest, and is consequently not a disappointment in this respect. It is, we should say, well adapted to use in colleges of mechanical engineering as a text book, and will give the student a clear understanding of the essential points, both of similarity and dissimilarity, in the several types of turbines now before the public, with a just and judicial analysis of their operation in practice. Professor Thomas is a teacher who takes his function seriously, and evidently adapts his style in writing to the habit of the college lecture platform. It is an admirable style for a text book, but does not give us a volume which one would be likely to take to the country with him for light summer reading. The romance of the remarkable cycle in steam engineering which has brought us back to the starting point, after a flight through the infinite refinements and complexities of the compound condensing engine, does not appeal to him, or, if it does, he does not let the reader know it. Perhaps a little more imagination introduced into what is designed to be distinctly educational literature would be stimulating in its influence upon the student, but as that is a question upon which experts in pedagogy may be expected to differ it need not be discussed in a book review.

An important change of company name took place April 1, when the Sawyer-Man Electric Company became the Westinghouse Lamp Company. Thus the name of the pioneer company in the lighting industry becomes a matter of history. It has, of course, been generally understood for some years that the Sawyer-Man Electric Company was a Westinghouse interest, and the change of name is but a logical result of changed conditions.

bridge building industry, for example, where material costs have fluctuated little or not at all, competition has been such as to keep prices for fabrication and erection within very moderate bounds, and in recent months prices below those of 1906 have been named.

The conclusion is that prosperity makes wide variations in profits even in the same industry, and that the uneconomic production of a time of scarce labor and materials may change greatly calculations of profit based on the records of less active periods.

The Steel Corporation and Public Sentiment.

Press comments on the report of the United States Steel Corporation for 1906 would seem to indicate that sentiment regarding its conduct and its influence is more friendly as time passes. Its conservatism in the matter of prices is approved and its rigorous reservation of millions for new construction. Three years ago a similar annual report was received with questioning where it did not provoke open hostility. The preferred stock conversion deal of 1903 was then fresh in mind, and there was a disposition to regard the financial statement as lacking in a number of details that would have permitted a better appreciation of the corporation's methods and status. This distrust was reflected in the quotations for the corporation's stock, the preferred having fallen to 55½ and the common to 10½ in April, 1904, or not far from the low points subsequently touched. As an example of the change wrought by the events and the policy of the past three years, the following from the *Philadelphia Press* is significant:

Regularly every three months this giant trust announces just how much money it has earned, how much it has spent and in what ways, and also the amount of work on hand that is to be done. It has just made its annual report for 1906, which shows unexampled gains in the volume of business done. There is also displayed the proof of a most conservative policy. For example, the corporation, after paying all fixed charges, such as bond interest and sinking fund and also the preferred stock dividend, could retain \$73,000,000 of profits. Of this sum the common shareholders received but \$10,000,000, while a cool \$50,000,000 was set aside for new construction. The balance goes into the surplus fund. It is a significant and remarkable fact that during the past couple of years, when investigations have been applied to almost every other big institution in America, never a word has been raised against the United States Steel Corporation. The reason is that, owing to its conservative policy and to its plan of letting the whole world know about its affairs, it invites only favorable criticism.

Apart from the features of its early financial operations which came far from meeting general approval, the Steel Corporation had to contend in its formative years with frequent changes in personnel and with the inadequacy of the tentative methods developed without the check of precedent or the guidance of experience with so huge a piece of corporate machinery. The past three years have been a period of development and seasoning. In these years but two changes have taken place in the presidencies of subsidiary companies, whereas more than a dozen such changes occurred in the first three years of the corporation's existence. The men now responsible for results have been long enough together to secure the benefits of team work and to have confidence in the stability of the present ordering of affairs. It would be difficult to measure exactly the effect of this transition from a formative to a settled state, in analyzing the latest financial statement, but it is concededly a factor of tremendous importance. Far from fulfilling prophecies of the elimination of the personal element and of that spur to the best individual effort which was considered to be peculiar to the old régime, the Steel Corporation has been demonstrating in recent years that the spirit of the corps may become one of its best assets.

Workmen's Misapprehension of Costs and Profits.

A potent reason for discontent among manufacturers' employees is their lack of comprehension of the costs of production and their consequent exaggeration of employers' profits. The average workman is not in position to have accurate knowledge of the expense of a manufacturing business, beyond the two items of labor and materials, and even in these basic elements of cost he does not always go far enough in his calculations. Add to this ignorance the impressions of selling prices which the men receive from catalogues and price-lists, and the result is a not unnatural misunderstanding of conditions, which may end in discontent and its troublesome accompaniments. In this connection should be mentioned the workman's failure to see the importance of substantial, even large, profits in flush times, that there may be sufficient resources to tide over periods of dull business while keeping works in operation and men employed, constituting a factor of the future as important to the employee as to his employer.

Manufacturers have discussed methods of remedying this condition. The solution resolves itself into the education of the employee, and this would mean taking him into the confidence of the employer, though not necessarily to the fullest extent. He could at least be given a few rudimentary facts. As the matter stands to-day, a workman may argue that while his labor on a piece of work is, say, 50 cents, and the material is worth no more than 40 cents, yet the manufacturer gets \$2.50 for the piece, thus making an exorbitant profit. He therefore believes he should get something more of that profit. He argues that his wages are inadequate as compared with the earnings of the owners of the business. If his deductions were correct no one could dispute that he might be given higher wages without prejudice to the rights of the capital which employs him. But his deductions are grievously wrong. He does not consider, because he knows nothing about it, the all important general expense, the overhead cost, which eats into profits oftentimes faster than do material and labor. A general expense of 100 per cent. as compared to cost of labor is common enough, and there are lines in which 200 and even 300 per cent. is none too much to reckon into cost before profit can be said to begin. It would be difficult to find an employee of such a manufacturer who could be made to believe this unless he were confronted with unimpeachable figures. There are plenty of manufacturers who do not themselves comprehend the full import of their costs above those of labor and materials. Selling expenses are usually heavy. Costs of power, rent, insurance, salaries, maintenance of plant and equipment, telephone, postage, stationery, water, the hundreds of incidental expenses of shop and office, the charge-off for depreciation—all go to make up an astonishing total. Those who really know what these expenses mean can comprehend what ratio they bear to labor and material. It is small wonder that such figures shrink into insignificance as they are bandied about in shop discussions.

Employees like to figure costs of products of their own shops. They can get at the figures for labor and materials pretty accurately, and they learn what the product brings in the market. They subtract the one figure from the other and term the balance profits. A skilled mechanic of more than ordinary intelligence made the statement recently: "That machine cost not a cent over \$225 and it sells for \$500," and he would not accept the statement, which is absolutely true, that the great

gap between the two figures was largely filled by the great item of general expense, and the profit was rather a small one considering the present market.

There is the other side to this question of profits which the employee should, but does not, bear in mind. The manufacturer should make large profits when his market is in condition to bear them. He must not calculate his net earnings on the totals of a few years of good times, but he must take into account an average of years, including those which constitute periods of loss. Most manufacturers have seen in the past their surplus accounts wiped out in trying to keep their works running. These accounts have stood between important houses and failure. Many manufacturers to-day are accumulating surplus accounts; not all of their earnings, it is to be hoped, are going into dividends and improvements. A period of prosperity such as this gives to the business house that takes proper advantage of the opportunity the strength, the general stability which will enable it to withstand the strain when more money is going out than is coming in. When dull times arrive the workman's position is a precarious one. He is dependent upon the ability of his employer to keep the works running. Most manufacturers endeavor to maintain their working forces intact during times of depression. Men must be laid off, of course, but the effort is to keep together as many as possible of the best, most trustworthy men. There are hard business reasons for this, as well as the kindly spirited desire to give workmen a chance to earn their living. But neither reason can avail unless there are funds with which to pay the bills, and now is the time when those funds are gathered together, or credits are placed where they can command the money when it shall be needed.

These are some of the conditions of business which the workman is not able to take into account, because he does not fully realize them. Probably he has never been taught. There are some men who could not be taught, because they never would believe. But there is always a goodly leaven of intelligent, fair minded, even broad minded, men, in every establishment, who can be educated. Perhaps well prepared literature would have its effect. Perhaps shop talks, illustrated by actual costs as they exist in that shop, would do the most good. Perhaps seeds could be sown through apprentices, during their terms of training, so that when they become journeymen they could help along the work of education. There is apt to be a cynicism among employers that their men would not see things as they are, even were they given fullest opportunity to learn the facts; that prejudice against the employer because he has more of this world's goods is what counts, rather than ignorance of conditions. There must always be some envy of another's better fortunes, but we believe those of which this is true are in the minority in the workshops and mills, especially where better classes of workmen are employed.

The rise in the price of platinum is one of the phenomenal features of the advance in the values of metals in the past two years. The Ural District of Russia is the source of nearly 90 per cent. of the supply. In 1906 platinum reached a price five times that of 1890. In the latter year 6200 roubles per pood (36 lb.) was the market price, this representing a 100 per cent. increase in 10 years. In 1901 the price per pood was 16,000 roubles; in 1902, 17,300; in 1903, 18,500; in 1904, 21,000, while last year the price rose from 22,000 roubles in January to 34,000 roubles in October. Exports have increased steadily. In the first six months of last year the total was 156 poods, as against 48 poods and 82 poods, respectively, in the corresponding periods in 1905 and 1904.

The Dedicatory Exercises of the Engineering Societies Building.

The committee in charge of the arrangements for the dedicatory exercises of the Engineering Societies Building, New York, on April 16 and 17, has drawn up a programme of which the following are the principal features:

The exercises will be opened April 16 by Charles Wallace Hunt, presiding officer, who will use as a gavel the setting maul employed by Mrs. Carnegie in laying the corner stone of the building. After prayer by the Rev. Edward Everett Hale, Chaplain of the United States Senate, communications will be read from the President of the United States, from the President of the Republic of Mexico, and the Governor-General of Canada.

Charles F. Scott, chairman of the Conference and Building Committees, will deliver a historical address. E. E. Olcott, president of the United Engineering Society, in behalf of the Founder Societies, will accept the building. There will be an address by Andrew Carnegie, the donor of the building, and finally an oration by President Arthur T. Hadley of Yale University, on "The Professional Ideals of the Twentieth Century."

In the evening there will be a general reception in the main auditorium, and later on a reception by the officers and councils of the Founder Societies in their respective headquarters.

On the afternoon of the second day, April 17, after an introduction by J. W. Lieb, Jr., chairman of the Dedication Committee, addresses will be delivered by the presidents of the Founder Societies: Dr. Samuel Sheldon of the American Institute of Electrical Engineers, Dr. F. R. Hutton of the American Society of Mechanical Engineers, and Dr. John Hays Hammond of the American Institute of Mining Engineers. Greetings and felicitations will be received from foreign and national scientific societies and institutions of learning.

Then will follow an address by Dr. James Douglas, past president of the American Institute of Mining Engineers, and the presentation of the John Fritz Gold Medal to Dr. Alexander Graham Bell of Washington, by Charles F. Scott, chairman of the John Fritz Medal Board of Award.

The proceedings will terminate with the presentation by Dr. A. R. Ledoux of a medal in recognition of distinguished services to the three men who have for so many years acted as secretaries of the Founder Societies, namely: Ralph W. Pope of the Electrical Engineers, Dr. F. R. Hutton of the Mechanical Engineers, and Dr. R. W. Raymond of the Mining Engineers.

Ohio University Students Visit Milwaukee Plants.

—Eighty-seven students of the mechanical, chemical and engineering departments of the University of Ohio, under the escort of F. C. Caldwell, professor of electrical engineering, and his assistants, E. A. Hitchcock and G. A. Anderegg, visited Milwaukee March 27 and 28. The students made the trip from Chicago to Milwaukee by boat, and at Chicago were met by R. B. Watrous, secretary of the Citizens' Business League, who adopted a unique method to give them some advance information concerning the city they were to visit, by giving a stereopticon illustrated talk on Milwaukee in the dining cabin of the steamer on their evening trip. While in Milwaukee the students visited the plants of the Allis-Chalmers Company and on one day were the guests at luncheon of the Allis-Chalmers Club at West Allis. Other places visited were the plants of the Semet-Solvay Coke Company, Cutler-Hammer Mfg. Company, National Brake & Electric Company, Nordberg Mfg. Company, Pawling & Harnischfeger, Milwaukee Gas Light Company, North Point Water Works, the several plants of the Milwaukee Electric Railway & Light Company, and the shops of the Chicago, Milwaukee & St. Paul Railroad.

The submarine boats Viper and Tarantula, building at the works of the Fore River Shipbuilding Company, Quincy, Mass., were launched March 30. They will soon have their trials and be delivered to the United States navy.

Canadian Developments.

Proposed Works for Electrically Smelting Ores.

TORONTO, April 1, 1907.—So far the experiments in the electrical smelting of iron ore, which were carried on last year at Sault Ste. Marie, under the auspices of the Dominion Government, have not been followed by any commercial ventures into the manufacturing of pig iron in Canada by this process. Blast furnaces have since been built and others projected, but enterprise does not seem to be very forward in the new field into which the Dominion Superintendent of Mines made this opening. Yet once assured as to the economy of electric smelting, capitalists who are looking about for opportunities to establish iron making works must regard the other conditions as favorable here. Explorations continued by the Geological Survey of Canada and the Ontario Bureau of Mines fail to discover great bodies of high grade iron ore in this province, though considerable masses of comparatively lean or more or less refractory ores are cropping up from time to time in various parts of the region north and west of the Great Lakes. In the economic utilization of this abundant low grade ore seems to lie the solution of the problem that the rapid exhaustion of Bessemer ores everywhere is creating. This country's increasing demand for iron and steel will soon attain an enormous annual capacity, and any violent and sustained advance in the price of these commodities would impede national progress. Besides the facts that no great deposits of high grade ore have yet been found in Canada, that the world's known supplies of such superior ores are being rapidly consumed, and that Canada has vast stores of poorer ores, there are these further conditions favorable to electric smelting here, that in all parts of the country are to be found natural water powers, capable of running great industries, and that the development of cheap, hydro-electric power is assured by the policy of the Ontario Government. If the metallurgists have found a process that satisfies the economists the electric smelting of iron should become a flourishing industry in Canada.

A bounty for the encouragement of the electrical smelting of iron is being sought from the Dominion Government. The Finance Minister is supposed to have the matter under his consideration. It is improbable that he will meet the wishes of the petitioners. In the first place, the existing iron and steel bounties are just now at the high point of unpopularity. The annual sum distributed on their account has become very conspicuous by its magnitude, and from many agricultural constituencies have recently come petitions for the discontinuance of this aid to the iron and steel industry. In the second place, as electrically-smelted iron would be eligible for the bounty now provided for pig iron, and electrically-produced steel would be entitled to the bounties on steel ingots, the case for a new bounty does not seem a strong one. In the third place, the natural and commercial conditions are so favorable for the making of iron and steel by any feasible electrical method that special aids would not seem to be needed. A special bounty extending over a period beyond that of the tenure of the diminishing iron and steel bounties is desired. If such is conceded an electrical smelting plant is to be established in Willand, and another at some point in British Columbia.

At the fifth annual meeting of the Ontario Society of Chemical Industry, held in the School of Science, in this city, a few nights ago, a paper was read by S. Dushner, on "The Recent Progress in Electric Furnaces." By an electrical process Ontario's sulphurous and refractory ores can, in Mr. Dushner's opinion, be smelted at a cost not less than that of blast furnace treatment.

The Atikokan Iron Company.

A cargo of coke for the Atikokan Iron Company's furnace at Port Arthur will be one of the first shipments up the lakes, when navigation opens. With the arrival of this fuel it is expected the furnace will be blown in. There was a rumor that Mackenzie & Mann intend to establish a steel plant in Hamilton. This has been denied by Mr. Mann, who says that Port Arthur will be the point at which any developments of this kind

on the part of his company will be carried out. He added: "We will wait for the development of the Port Arthur furnaces, and if it is as successful as we anticipate it will be we will then establish at your city industries that the people cannot at the present time estimate the importance of. Our company has in view the establishment of some large works adjacent to the furnaces if everything turns out satisfactory."

Bessemer Converters for Sydney.

In another month, it is expected, the two Bessemer converters that are being installed at the Dominion Iron & Steel Company's plant in Sydney, N. S., will be ready for operation. Notwithstanding the severity of the winter the work, which is in the hands of a company in New Castle, Pa., has progressed steadily since it was begun last fall. The converters will greatly expedite operations at the company's works and increase the output. The company's present output of steel ingots is insufficient to keep its rolling mills busy. To keep pace with the demand for rails the rail mill must have more material. In spite of great difficulties caused by the exceptional severity of the winter the company has been able to make deliveries of rails fast enough to satisfy its customers, who on their part have likewise been retarded in their construction work by the rigors of winter and the scarcity of labor. In the first week of March the Sydney plant was largely tied up as a consequence of stormy weather, three of the blast furnaces having to be closed down because of the difficulty of getting fuel from the coking plant. Five of the open hearth furnaces were burnt out at the bottom. During the brief tie-up all the steel furnaces were overhauled.

At the annual meeting of the Nova Scotia Steel & Coal Company President Harris said that there is sufficient ore in sight at the Wabana mines to keep the blast furnaces going for 25 years.

New Reduction Works.

Works for the reduction of Cobalt ores are to be built at Thorold, in the Niagara peninsula, the ore to be furnished by the Coniajas and other mines in the silver area. The by-law in aid of the undertaking was approved by the ratepayers a few days ago, and a large plant is to be built at once.

"Electro-Metals, Limited" is the name of a company that has just received letters of incorporation from the Ontario Government. Its head office is to be at Willand, and its capital \$300,000. It is authorized to smelt, refine, and otherwise treat metalliferous ores.

The German-Canadian Smelting & Refining Company is to build a plant at Sault Ste. Marie. It is to use the secret Schneeberg process.

The Montreal Reduction & Smelting Company's plant, at Trout Lake, near North Bay, is approaching completion. Machinery for it is on the way.

At Cobalt the North American Reduction Company is putting up a plant.

At the Copper Cliff smelter of the Canadian Copper Company, cobalt-silver ores are being treated, a portion of the silver being recovered there, and the process being continued at related works in the United States.

According to the recently issued report of the Dominion Superintendent of Mines the United States works at which Cobalt ores are treated, are those of the following companies: The American Smelting & Refining Company, Perth Amboy, N. J.; Balbach Smelting & Refining Company, Newark, N. J., and Oxford Copper Company, Camden, N. J., and New York City.

The numerous new plants projected and under construction in Ontario call for a considerable quantity of equipment, some of which is furnished by Canadian manufacturers and some by American. Toronto's customs entries have been increasing at a rapid rate for many months, one element in the increase being the importations on account of Cobalt development, machinery being a large item in such trade.

C. A. C. J.

On Friday, March 30, there was turned out at the Lorain plant of the National Tube Company, Lorain, Ohio, 2481 tons of finished pipe. The best previous record for output was held by the National department at McKeesport, which in one day recently turned out 2421 tons.

Trade Publications.

Tool Grinders.—Gisholt Machine Company, Madison, Wis. Catalogue. Size 8 x 10 in.; pages 24. Gives an illustrated description of the Gisholt universal tool grinder, for grinding lathe and planer tools, including bent and round nose types. The operation is simple and the work accurate. Former blocks to aid in the correct forging of tools, lathes, boring mills and turning mills are also dealt with. This catalogue is an unusually fine specimen of book work, having tinted illustrations.

Metallic Packings.—The United States Metallic Packing Company, Philadelphia, Pa. Pamphlet. Describes metallic packings for steam, gas and air, the arrangement of the packing being shown by illustrations. The company points out that the packing is already in use on the main engine piston rods and valve stems of many of the new vessels of the United States Navy, and also gives specifications to be used when inquiries regarding packings for different pressures are made, as it is pointed out that packings for 250 lb. pressure would not give good results at 50 lb. pressure.

Engines.—Shepherd Engineering Company, Franklin, Pa. Bulletin No. 10. Gives a detailed description of the Shepherd vertical single cylinder, single valve, center crank engines, A-B series, as made in sizes from 6 to 10 in. stroke, ranging in capacity from 8 to 75 hp. Tables of horsepower at various speeds and pressures, weights, over all dimensions and foundations are included.

Pulleys.—Forster Pulley Works, Cuba, N. Y. Catalogue and circulars. The catalogue is entitled "Pulley Pointers," and describes various styles and sizes of wood split pulleys, which are claimed to be the best form of pulley known. One circular is mainly a standard price-list of wood split pulleys. The others deal respectively with the Estes compression couplings and Standard compression couplings.

Hoisting Machinery.—Parker Hoist & Machine Company, Chicago, Ill. Catalogue No. 19. Size 5 x 8 1/4 in.; pages 87. Lists the full line of the company's engines, derricks, cranes and hoists of various sizes and capacities. The parts of these are dealt with, and also material elevators, timber dollies, trucks, billet cars, wheelbarrows, concrete carts, hods, concrete mixers, Parker I-beam and flat rail trolley systems, chain and belt elevators, &c. Several illustrations show the Parker hand power derricks in use. These derricks were described in *The Iron Age* February 21, 1907.

Iron and Steel Stock and Supplies.—Scully Steel & Iron Company, Chicago. Stock list for March and April. In general this covers about the same range of steel and iron bars, sheets, plates, structural shapes, &c., and miscellaneous metal working machinery, as the last issue of the stock list. Notice is called to a reduction in prices of forged steel boiler flanges and an increase for galvanized steel wire strand.

Engines.—Ajax Iron Works, Corry, Pa. Catalogue. Pertains to the Ajax gas and gasoline engines, containing a description of their general construction, illustrations of the various types, including the standard horizontal types for gas and gasoline, the horizontal pattern with crosshead, single and tandem cylinders and two vertical styles, one with inclosed base. The catalogue also covers general information and gives a table of sizes and prices of the engines.

Filters, Exhaust Heads and Ventilators.—The Burt Mfg. Company, Akron, Ohio. Catalogue. Size, 6 1/4 x 9 1/4 in.; pages 63. Describes and illustrates the styles A and B Cross oil filters; the American oil filtering system, an illustrated description of which was given in *The Iron Age* October 5, 1905; oil reservoirs and pumps; the American and Warden oil filters and the Burt ventilators and exhaust heads. A partial list of users of these devices is given.

Hoists, Cranes and Electrical Apparatus.—Sprague Electric Company, 527 West Thirty-fourth street, New York. Flyer and bulletin. Flyer No. 225 is intended merely to call attention to the electric hoists and cranes in their various combinations as built by this company, including the S-1, S-2 and S-3 types of hoists, mono rail crane, type W worm geared hoist, single and double beam cranes, vertical electric winch and electric winding drum hoist. The bulletin is entitled "The Electrical Equipment of a Modern Hotel," and describes and illustrates the electrical equipment installed in the Hotel Gotham, New York City, by this company.

Electrical Apparatus.—Fairbanks, Morse & Co., New York City. Bulletins. Nos. 20, 22 and 24 deal respectively with standard E. Type motors, standard E type direct current dynamos, and standard EE type dynamos and motors; No. 26 lists a line of special motors; No. 30 pertains to gas and gasoline engine driven units for electric light and power plants; No. 38, to Type L. L. engine type generators in capacities of from 50 to 300 kw.; No. 202 is devoted to alternating current, B type, constant speed induction motors, and No. 203 to induction motor starting devices. These bulletins, except Nos. 26 and 203, supersede all previous bulletins on their respective subjects.

Grinding Pans.—Phillips & McLaren, Pittsburgh, Pa. Leaflets. Deal with wet and dry grinding pans for brickyards, steelworks, potteries, chemical works, sand plants, glassworks, &c. A list of users is given.

Electrical Apparatus.—General Electric Company, Schenectady, N. Y. Catalogue and bulletins. Catalogue No. 4468, of the power and mining department, superseding No. 1045, is 8 x 10 1/2 in. and contains 53 pages. This deals with electric mine locomotives of various types and capacities. Photographs show these locomotives in operation in mines throughout the world. The claim is made that by the use of electric locomotives the economy is often sufficient to pay for the investment in less than one year. Tandem locomotives, weighing from 20 to 25 tons, and electrically operated coke-oven larries are also dealt with. Various tables of weights, dimensions, capacities, &c., and also miscellaneous data and information are included in the book. Bulletin No. 4473 is devoted to the GE-81 railroad motor, giving front, back and interior views and a schedule of speeds. No. 4470 has for its subject the electric motor in saw-mill work, and No. 4466, superseding No. 4398, pertains to remote control field rheostats for railroad generators and rotary converters.

Sawing Machines and Saw Blades.—Niles-Bement-Pond Company, 111 Broadway, New York. Catalogue. Size 6 1/4 x 9 1/4 in.; pages 46. This catalogue was compiled by the Tindel-Morris Company and the High Duty Saw & Tool Company in behalf of their distributing agent in this country. It illustrates and describes the Monarch cut-off machines, double rotary slotting machines, Paragon cold sawing machines, Paragon combined vise and table, Paragon high duty rotary planing machines, Tindel high duty saw blades and teeth, and Tindel high duty saw blade grinding machines. The instructions given on how to use a Tindel high duty saw blade given in this catalogue will be of considerable value to users of them.

Electric Car Couplers.—Ohio Brass Company, Mansfield, Ohio. Monthly bulletin. The February issue of this company's monthly bulletin in addition to other matter contains an interesting illustrated description of the Tomlinson automatic radial car coupler, which is now manufactured by this company. It is stated to be the latest development in automatic couplers for electric railroad operation, and the only radial type on the market which is absolutely automatic in its action. It is particularly useful for connecting up trains such as are operated on elevated roads, subways and interurban roads, and will work with all standard radial car couplers now in use. By the addition of a combination knuckle it will couple with a standard M. C. B. coupler of the Janney type, making it possible to couple with steam railroad cars.

Pipe and Fittings.—McNab & Harlin Mfg. Company, 50 John street, New York City. Catalogue. Size, 5 x 7 in.; pages 285. Cloth bound. This is the ninth edition of the company's illustrated catalogue and price-list, and has its subject matter divided under the following headings: Pipe, iron pipe fittings, drainage fittings, flanged fittings, wrought and malleable iron fittings, iron body work, brass fittings, brass valves, brass goods (engine and boiler fittings except valves), hydraulic work, hose goods, plumbers' brass goods, gas fixture fittings and tools. Attention is called to a change in style of some of the old patterns of valves, &c., and to the following added lines manufactured: Extra heavy iron body globe and angle valves, outside screw and yoke iron body gate valves, iron body Jenkins disk valves, stop and check valves combined, sea cocks, dye house swing joints, &c. In this catalogue goods not made by this company but formerly listed have been eliminated with the exception of malleable iron fittings, gas fixture fittings and tools.

Ground Automobile Crank Shafts.—Norton Grinding Company, Worcester, Mass. Circular. Distributed at the recent Automobile and Power Boat Show in Boston. Calls attention to the company's special department for turning out finished ground crank shafts for automobiles and small gas engines, and the cylindrical grinding machines built for such work by the company and furnished to those who wish to grind their own cranks.

Conveying Equipment.—G. & W. Mfg. Company, 26 Cortlandt street, New York. Catalogue. Size 6 x 9 in.; pages 16. Deals with a recently patented ball trolley and track for the overhead handling of heavy loads in manufacturing and contracting plants, standard steel I-beam trolleys, cast steel I-beam trolleys, I-beam switches, roller bearing trolleys for bar and other special shaped trolley tracks, light hand cranes, electric hoists and trolleys, industrial railroad equipment, buckets, cars, &c.

Tool Holders.—Armstrong Brothers' Tool Company, Chicago. Booklet catalogue, No. 14. Describes a line of drop forged tool holders of special design, and a three-bar boring tool in which a single holder is adapted to the use of three different sizes of bars. Other specialties in machine shop tools are also illustrated and described.

Water Filters.—The Lynn Filter Mfg. Company, Cincinnati, Ohio. Catalogue No. 6. Furnishes descriptive matter relative to the construction and operation of various sizes and styles of water filters. The gravity and pressure systems used in large installations are described, and the manner of connecting a battery of filters for the supply of apartment and office buildings is explained and clearly illustrated in a half-tone engraving. Analyses by prominent chemists of the water filtered through

these machines, showing effects on germs and other sustained matter, are given.

Concrete Block Machine.—Johnson Concrete Machine Company, Sioux City, Iowa. Booklet. Illustrates and describes the construction and operation of the Warren cement block and brick machine. Attention is called to the fact that odd or unusual shape blocks can be made upon this machine, and that cores are interchangeable for all angles and shapes. Directions for making concrete blocks and estimating cost of production are included.

Seamless Steel Tanks.—Nortmann-Duffke Foundry Company, Milwaukee, Wis. Catalogue A, 1907. Presents illustrations showing a line of seamless steel drawn tanks, cylinders and shells, for use as containers or pressure vessels. Outline drawings show the manner of fitting bottoms into tank shells by turning the rim of the shell around the flange, thereby dispensing with the necessity for riveting.

Steam Fitters' Supplies.—Nason Mfg. Company, 71 Fulton street, New York City. Reference book for the engineer, architect and mechanic. Size 8 x 11 in.; pages 1100. Gives a general description of the steam, water and gas specialties made and sold by this company, paying particular attention to high pressure fittings for ammonia work and also a large line of valves for various mechanical requirements. A portion of the catalogue is devoted to contractors' supplies, such as boilers, hoisting engines, vertical and horizontal steam engines, feed pumps, all kinds of shafting and appliances, as well as threading machines and tools. Some 300 pages are devoted to plumbers' supplies, including brass work, fixtures of all kinds and general plumbing appliances.

Rail Brakes.—Miller Supply Company, Huntington, W. Va. Pamphlet. Deals with the friction rail brake, a device for dropping railroad cars under coal chutes, over railroad or mine scales, &c. The advantages claimed are economy and safety and that only one operator is required.

Air Compressors.—Leather & Brass Mfg. Company, Auburn, N. Y. Pamphlet. Pertains to air compressors for air hoists, pneumatic tools, &c.

Boilers.—Oil City Boiler Works, Oil City, Pa. Catalogue. Size 9 x 12 in.; pages 24. Describes and illustrates the Geary water tube boilers, which have been designed with a view of meeting all modern requirements. The descriptive matter treats of the boilers in general, also of their parts and the material of which they are made. Numerous full page illustrations of Geary water tube boiler installations and a list of some users are included.

Motor Trucks.—Standard Motor Truck Company, Pittsburgh, Pa. Catalogue No. 2. Size 8½ x 11¼ in.; pages 27. Gives an illustrated description of solid forged, rolled steel, double and single standard electric car trucks of the M. C. B. type of construction for high speed city and interurban railroad service. Illustrations show these trucks as used on various electric railroads.

Blast Furnace Construction.—William B. Pollock Company, Youngstown, Ohio. Supplement No. 6 to the company's general book of views of blast furnaces which it has recently built. The photographs in this issue are of the furnace of the Girard Iron Company, Girard, Ohio.

Cement Siding.—The General Fireproofing Company, Youngstown, Ohio. Catalogue. Size 8 x 11 in.; pages 32. This catalogue is of pictures rather than words, and is intended to show what may be done with metal lath and cement on the outside of houses. The photographs show numerous buildings, the majority being private residences, throughout the United States which have been constructed by this method.

Lathes.—J. J. McCabe, 14 Dey street, New York City. Circular. Pertains to a new style heavy pattern "2-in-1" double spindle lathe with 26-48 in. swing.

Machinery.—Frank Toomey, 127 North Third street, Philadelphia, Pa. Catalogue. Size 6 x 9 in.; pages 29. Devoted to a line of metal working machinery, including engine lathes, drills, crank shapers, planers, milling machines, emery grinders, punching and shearing machinery, steam hammers, bolt threading machines, power hack saws, and lathe and drill chucks.

Electric Elevators.—Brodesser Elevator Mfg. Company, Milwaukee, Wis. Catalogue. Size 6¼ x 10 in.; pages 35. An illustrated description of electric passenger and freight elevators manufactured by this company. The types illustrated are the direct connected elevator, single gear full magnet control winding machine, electric engine with mechanical control and deflecting idler, double geared heavy duty freight elevator and ceiling machines. Two pages of references are appended. A pamphlet pertains to an automatic elevator screw brake, which is attached to the carrying beam of the car. Testimonials regarding the brakes are included.

Safety Gates and Doors.—Richmond Safety Gate Company, Richmond, Ind. Catalogue. Size 6¼ x 9¼ in.; pages 46. Lists the company's line of safety gates and doors, particularly adapted for use on freight elevator hatchways, &c. These include the Zeller, Duplex and H. & B. full automatic gates, Zeller open-at-will type, Columbia semiautomatic gate, underwriters' gravity fire doors, Richmond counterbalanced corrugated iron

doors, Richmond full automatic hatchway doors, division wall doors and the Richmond horizontal trolley door.

Crushers.—Sturtevant Mill Company, Boston, Mass. Pamphlet of the Sturtevant series 96. Deals with roll jaw crushers, which are built in seven sizes, with capacities from 50 lb. to 8 tons per hour. It is claimed that these machines will crush to ¼ in. and finer. Another pamphlet gives testimonials in brief regarding the roll jaw crushers.

The Worcester Metal Trades Branch.

The Worcester branch of the National Metal Trades Association, held its annual banquet in Mechanics' Hall, Worcester, Mass., March 28. More than 350 ladies and gentlemen were present, and listened to an unusually interesting programme of speeches and music. The assemblage was a very representative one, including not only the leading manufacturers in the metal trades of Worcester and its immediate vicinity, but also delegations from Fitchburg, Mass.; Nashua, N. H., and Providence, R. I., three cities which come into the same district. Fitchburg is already well represented in the Worcester branch and Nashua soon will be, but in Providence the Rhode Island Metal Trades Association is organizing, and doubtless will eventually become an integral part of the National Association.

President George F. Brooks, Harrington & Richardson Arms Company, presided, and in his opening remarks gave some interesting information regarding the work of the Worcester branch and its labor bureau. He spoke of the present membership, 63 in number, employing 10,000 men. "Our members are in Worcester, Fitchburg, Winchendon and Southbridge, and very soon there will be a member from Nashua, N. H., as our district from March 1 comprises Worcester County, two counties in New Hampshire and the State of Rhode Island." Mr. Brooks presented to the members and their guests M. H. Barker, Boston, the newly elected president of the National Metal Trades Association. William A. Lytle, president of the Worcester Board of Trade, responded for the city; Congressman Charles G. Washburn, head of the Wire Goods Company, spoke on "Memories of the Fifty-ninth Congress," and Chancellor James R. Day of Syracuse University made the principal address of the evening, on "The Accumulation of Wealth and the Political Control of Business."

The Cleveland Manufacturers' Club.—The Cleveland Manufacturers' Club, recently incorporated at Columbus, Ohio, held its first meeting at Cleveland, Ohio, March 29. Officers for the coming year were elected as follows: President, W. D. Sayle, president of the Cleveland Punch & Shear Works Company; vice-president, W. A. Comstock, secretary and treasurer of the Cleveland Wire Spring Company; second vice-president, William F. Billstein of the National Iron Wire Company; secretary, Albert F. Schroeder, secretary of the Globe Machine & Stamping Company; treasurer, C. S. Kurtz of the Cleveland Store Fixture Company. The club will undertake a campaign for the bettering of the manufacturing conditions in the northeastern part of the city, where the plants of its members are located. The questions of railroad facilities, particularly better handling of freight, also fire protection, street paving and the smoke problem are among the things which the new organization will take up. Twenty-three firms are represented in the membership.

The Michigan Crucible Steel Castings Company has been incorporated under the laws of Michigan for the purpose of manufacturing crucible steel castings, and will cater especially to automobile work. The office of the company will be at 248-250 Gulon street, Detroit, Mich., and it will be prepared to produce castings on or before May 1. The president and general manager of the company will be R. F. Flinterman, who has for some years been in charge of the laboratories and foundry practice of the International Harvester Company. The superintendent of the plant will be Mr. MacLeod, whose name has long been identified with the crucible steel castings industry.

Recent Customs Decisions.

Automobiles Dutiable as a Whole.

The first step in the litigation to compel the Government to assess automobiles and their tires at separate rates of duty has resulted in failure, as the Board of United States General Appraisers has handed down a decision adverse to the claims of the importers, the Auto Import Company and others of New York. In brief, the board supports the position assumed by the Treasury Department, which is that automobiles are entireties as imported, and must be so regarded for purposes of duty, the tires being assessed at the rates applicable to cars—45 per cent.

Importers expressed much dissatisfaction with the ruling made last summer that thereafter the practice of assessing cars at 45 per cent. under the metal clause of the tariff, and the tires at 35 per cent., as manufactures of rubber, was to be discontinued, and the value of the tires be included in the value of the machine upon which the higher duty would be levied. The dealers in the automobiles realized that the new rule would result in the payment of heavier duties, and it was decided to take the case before the Board of United States General Appraisers and the Federal courts. Now that the lower customs tribunal has found against the importers, the suit will be prosecuted with energy in the Circuit Court.

The finding of the board is written by I. F. Fischer, and strongly disapproves of the contention made by the importers. The decision says that to hold, as the importers ask, that the tires belonging to and accompanying an automobile and forming part of it are separately dutiable from it would be to rule that the nuts, bolts, beams, angle irons, &c., that may enter into the composition of a machine should be separately dutiable under the various provisions of the tariff law in which such articles are enumerated. It is well settled in tariff procedure that if the subject of an importation be a recognized entirety as a complete article, by which is meant that it has been advanced from the class of material by a process of manufacture or assembling into an automobile, a road roller, a carding machine, &c., it is dutiable as an entirety.

In conclusion, the board holds that there is no reason why the rubber tires should be segregated for dutiable purposes any more than the body of the vehicle, where there is one, which is usually of wood, or the leather or cloth in the upholstering, or the chains, axles, bolts or nuts which enter into the construction of the machine, all of which are covered by provisions of the tariff law equally specific with that for manufactures of India rubber.

Relative to claims made by the importers for partial exemption of duty on American owned machines returned to this country, the board is unwilling to follow the ruling of the United States Circuit Court of Appeals in the so-called Hillhouse case. In that case the court laid down the doctrine that an automobile used abroad for not less than a year could be treated as dutiable in part and free in part. "To extend this doctrine," says the decision, "would result in such a startling innovation in customs administration and law, and a radical departure from immemorial usage, that we forbear to initiate it."

Labor Cost Disregarded in Fixing Duties.

A decision just rendered by the Board of United States General Appraisers lays down the principle that in arriving at the dutiable value of imported merchandise the Custom House officers must disregard the amount of labor applied to any of the various materials during the process of manufacture. The ruling was called forth by a protest filed by F. B. Vandegrift & Co., New York, importers of rollers for paper calendering machines composed of steel shafts covered with paper. The rolls were returned for duty as manufactures of steel not specially provided for at the rate of 45 per cent. The importers, however, maintained that the articles are in chief value of paper and consequently liable to assessment at only 35 per cent.

As it was not feasible for the members of the general

board to have samples of the merchandise before them, the local appraiser at Buffalo, where the rolls were entered, was requested to make an examination and report. He states that the paper is pressed on the shaft by hydraulic pressure at an enormous pressure, so as to virtually make a solid paper roll and in conclusion says: "The metal and paper in their crude state are, in my opinion, of about equal value, but the work of pressing on the paper and truing it up appears to me to be much more costly than the mere turning of the shaft and collars. I would, therefore, return the merchandise as a manufacture of paper and metal, paper chief value, at 35 per cent."

General Appraiser Fischer, who writes the decision for the lower customs tribunal, points out that the Buffalo official is in error in taking into account the labor cost element. It is held that in ascertaining the component of chief value in an article for the purpose of classification for duty, the values of the several materials entering into the composition or construction of the article should be taken in their condition, as it was at that stage when, the materials having been assembled, nothing remained to be done but to put them together. "We hold," says the decision, "that, the paper and the metal being equal in value, the rolls here in question are dutiable, not under paragraph 407, which provides only for articles in which paper is the component of chief value, but under paragraph 193, as 'articles or wares not specially provided for in this act, composed wholly or in part of steel, whether partly or wholly manufactured.' The protest is overruled."

Duty on Pig Lead.

The board on April 1 decided adversely to the importers, Perry, Ryer & Co., New York, a claim dealing with the classification of merchandise returned by the collector as lead in pigs. The pigs were assessed at 2½ cents per pound, whereas the entry was claimed to be dutiable as type metal, at the rate of 1½ cents per pound on the lead actually contained in the pigs. The Government chemist made an analysis of two of the pigs, which showed 99.74 per cent. of lead, with a trace of antimony. An analysis of one pig, made by a chemist in the employ of the importers, showed the presence of antimony to the extent of 16.02 per cent. The decision remarks that the private chemist's report is worthless as legal evidence. Just the opposite conclusion was reached by the board in a protest filed by the Syracuse Smelting Works. It so happened that the customs officers in this case only analyzed 5 pigs, whereas the importer's chemist analyzed 15 pigs, his return being corroborated. The decision says that the analysis of the quantity selected by the importer affords a fairer basis for computing the amount of antimony in the mass than the few pigs selected by the appraiser. The protest is, therefore sustained.

Finished Castings Are Manufactures of Metal.

WASHINGTON, D. C., April 2, 1907.—The United States Circuit Court for the Eastern District of Pennsylvania has handed down a decision to the effect that the provision for "iron castings" in paragraph 148 of the tariff act does not include articles which have been advanced in condition by work bestowed on them after they were cast, and cast iron machinery parts, which, after being cast, have had holes drilled in them and have been chiseled to fit them for their intended use, are not included within such provision, but are dutiable under paragraph 193 as manufactures of metal. The court further holds that all the evidence which importers may have and which can be produced should be laid before the Board of General Appraisers, and upon appeal to the Circuit Court little weight should be given additional evidence which is cumulative and could easily have been submitted to the board. The decision is so comprehensive and important that the importers have advised the Treasury Department that they have taken an appeal therefrom to the Circuit Court of Appeals for the Third District.

In the case in question, that of Bromley vs. United States, the importation consisted of castings which were assessed for duty as manufactures of metal at 45 per cent. under paragraph 193. The importers claimed that

they were dutiable as "castings" of iron not specially provided for, at 8-10 cent per pound under paragraph 148. The Board of General Appraisers sustained the collector. The appraiser in reporting on the importation stated that the goods were parts of machines "drilled, bored, planed, fitted and finished beyond the condition of castings, and were properly returned for classification with and as part of the machines of which they form integral parts." The evidence produced before the Board of General Appraisers sustained the appraiser's report, and on a motion of the counsel for the Government the testimony in another case was made a part of the record to the effect that the word "castings" in the trade does not include articles made by the casting process which have been advanced in condition by work bestowed on them after they were cast. The case having been appealed to the Circuit Court additional evidence was presented by the importers, but the court sustained the board in a decision in part, as follows:

Testimony taken before Byron S. Waite, United States General Appraiser, before whom the matter was referred by the court to take further testimony, as provided under section 15 of the customs administrative act of June 10, 1890, is simply cumulative and entirely to the same facts upon which evidence was taken before the Appraiser and the Board of United States General Appraisers. There is nothing in the testimony different from that already before the board.

It was intended that the customs administrative act should provide the importer with a convenient and expeditious method of disposing of his controversies in the payment of duties on importations, and the Board of General Appraisers is the tribunal before whom the importer is required to submit his case. All the evidence he may have and can produce should be laid before this tribunal for its consideration in determining the right in each particular controversy, and, upon an appeal to the Circuit Court, little weight should be given to additional cumulative evidence which could easily have been submitted to the Board of General Appraisers for its consideration. The decision of the Board of General Appraisers is affirmed.

In view of the general interest in the outcome of this issue the Government will join in the effort to advance the case for the consideration of the Circuit Court of Appeals.

W. L. C.

Old and New Methods of Railroad Building.

In the building of the new tidewater deep water line on low grades from the mountains of West Virginia to the seaboard a contrast is presented to the early railroad construction methods, which apparently put first cost before ease and economy of operation. Because of the aim to avoid construction difficulties and expense the old time lines have cost hundreds of thousands of dollars in reconstruction—in lessening grades, eliminating curves. The days of the hand shovel and the cart made obstacles in filling and making cuts seem insuperable that to-day with steam shovels and the use of locomotives for hauling earth for fills are easily overcome. The *Railroad Gazette* treats the Norfolk & Western and the Tidewater-Deepwater as examples of the contrasted methods, describing them as follows:

Starting in the low ground of eastern Virginia, the Norfolk & Western has wormed its way across the country to the mountains, and by climbing their summit and following the flow of the streams has reached the Ohio. Much of the work in the early days was tentative, with nothing in sight ahead but the local traffic of the towns it touched, so that no long extensions were made until the railroad was well into West Virginia and a western outlet became desirable. But the purity of the coal found in the region which it tapped doubled and trebled its traffic by leaps and bounds with the result that it was hampered and clogged by its own prosperity. The result of this has been the inauguration of a series of improvements extending over a number of years, in which many miles of line have been rebuilt, and in which a great deal of curvature has been eliminated, accompanied, in some cases, by a notable reduction of grade. In this there has not been so great a reduction of distance as might have been expected from the amount of track that has been built, so the remuneration for the investment will have to be found solely in the added speed of trains and the general lessening of the obstacles to trans-

portation by which the capacity of the road can be increased. The increased traffic calls also for increased terminal facilities at division points where extensive yards are being built that involve the removal of large quantities of material on account of the natural topography of the ground where they are located. Hills have been leveled and valleys filled to such an extent that it is impossible to judge from the final appearance the amount of work that has been done. This is the example of the betterment of a road, otherwise in prime physical condition, that was built under the old régime, but which demanded that these changes should be made so as to bring it up to modern standards and requirements.

In contrast with this condition and yet paralleling it in the results, we have the building of the Tidewater-Deepwater, which is a notable example of the modern spirit of location, that sets a grade and a rate of curvature in the quiet of the office; that makes a careful study of the country's topography before a party is put into the field; that works over the feasibility of the line in seclusion, and determines where it is worth while to make surveys; and, then, having settled these points, investigates and maps the country with a completeness that gives such a broad and comprehensive view of the situation than there is no gainsaying the contention that the best location the country affords has been secured. It is short, direct, and within the arbitrary limits of grade and curvature that have been set, and is a marked illustration of the value of extensive topographical work. Such work costs more to prepare, and it is apt to cost more to execute than that where a single preliminary is run which is afterwards adopted for location. This is not a case of pigheaded persistence in a course that has been adopted simply because it has been adopted, but a cold blooded calculation that the expenditure of so many dollars and cents will pay a certain definite interest on the investment. Where such work as this is done the relation existing between the cost of building and the cost of operation is never lost sight of, and where a decrease of the one is possible there is no hesitation about increasing the other.

Aside from the engineering features the building of this new low grade line from the West Virginia mountains to the sea offers a notable example of advanced railroad practice in that the line is built from a coal territory where few mines have been opened, with an absolute disregard of all local traffic, and with the courage of the conviction that when the facilities are offered the mines will be operated and the product offered for movement in quantities sufficient to warrant the outlay in the preparation.

In such work as that exemplified by the two roads under consideration we have, side by side, the spirit of the new railroad construction and that which has been born of the requirements of great traffic on a road built by a past generation. Of course such work of improvement and such construction would hardly be warranted where light trains and few of them were to be run. This will hold for many roads in remote communities where nothing but a light local traffic can ever be expected, but, as roads develop, some such betterment as is outlined may be expected to come in for the old roads, while for the new the idea of coupling the estimates of future possibilities with present first cost and making the second dependent upon the first has become a well established economic principle.

Jacob Reese, whose death at Sharon Hill, near Philadelphia, was noted in these columns last week, was the first buyer of Lake Superior ores for use as mill "fix" in the Pittsburgh District. The Cleveland Iron Mining Company shipped 1449 tons of ore from its Marquette range mine in 1855, the year of the opening of the canal at Sault Ste. Marie. Mr. Reese ordered a trial lot from that year's shipment, and later in the year bought several hundred tons. In the period 1856-1860 he sold over 50,000 tons of the Cleveland ore for fettling. Mr. Reese wrote to the Cleveland Iron Mining Company in 1855 that a fixing of its ore lasted three or four days, while the Eastern ores used for the same purpose had to be renewed every 24 hr.

February Iron and Steel Exports and Imports.

Both exports and imports of iron and steel showed a decline in February, as compared with the previous month, according to the report issued by the Bureau of Statistics of the Department of Commerce and Labor. It must be remembered, however, that the month of February was considerably shorter than January, and this might account for a part of the difference, as the decline was not considerable. The total value of the February exports of iron and steel and manufactures thereof, not including ore, was \$13,946,042, against \$14,327,926 in January. The corresponding figures for imports in February showed a total value of \$3,020,986, as compared with \$3,296,062 in January.

The export figures for commodities for which quantities are given show 87,908 gross tons in February, as compared with 102,620 tons in January. The following table gives the exports of such commodities for February and for the eight months ending with February in 1907 and 1906:

Exports of Iron and Steel.

Commodities.	February.		Eight months.	
	1907.	1906.	1907.	1906.
Pig iron.....	4,743	6,934	56,199	31,281
Scrap	1,254	374	8,876	7,167
Bar iron.....	4,881	3,645	36,822	22,001
Wire rods.....	31	348	2,620	3,621
Steel bars.....	3,538	2,005	24,430	12,655
Billets, blooms, &c..	4,193	21,912	79,601	184,465
Hoop, band, scroll...	186	174	4,514	3,976
Steel rails.....	20,987	24,017	195,635	221,748
Iron sheets and plates	3,591	897	17,264	6,422
Steel sheets and plates	5,948	4,507	62,709	43,930
Tin plates andterne plates	590	1,069	3,437	3,946
Structural iron and steel	8,848	5,479	78,307	57,317
Wire	14,112	13,204	110,244	99,336
Cut nails.....	515	539	5,009	4,659
Wire nails.....	3,530	4,810	24,814	26,142
All other nails, in- cluding tacks.....	643	192	4,405	2,613
Pipes and fittings.....	10,318	15,031	84,273	96,646
Totals.....	87,908	105,137	799,159	827,925

While nearly all the items given in the above table showed a decline in February, a noteworthy exception occurred in the case of wire, which made a decided gain. The exports of wire in January had been 10,794 gross tons, but in February they increased to 14,112 tons.

The imports of commodities for which quantities are given show a total of 60,700 gross tons in February, as compared with 63,667 tons in January, indicating that the daily rate of imports in February more than kept up to the daily rate for the preceding month. The quantity imports for February and for the eight months ending with February, in 1907 and 1906, were as follows:

Imports of Iron and Steel.

Commodities.	February.		Eight months.	
	1907.	1906.	1907.	1906.
Pig iron.....	48,982	14,972	332,002	165,019
Scrap	775	2,599	12,794	21,988
Bar iron.....	3,998	3,586	27,395	29,713
Rails	105	331	3,129	8,434
Hoop, band and scroll	13	283	4,058	4,742
Billets, slabs, bars, &c.	1,211	1,230	14,023	12,710
Sheets and plates....	1,090	359	2,521	1,773
Tin plates andterne plates	2,235	2,037	38,140	34,950
Wire rods.....	1,509	1,257	11,675	12,474
Wire and articles made from	609	196	5,253	2,454
Structural iron and steel	173	1,529	8,355	20,255
Totals.....	60,700	28,379	459,345	314,512

The total exports of all kinds of iron and steel and manufactures thereof, but not including ore, were valued at \$115,605,790 in the eight months ending with February, as compared with \$101,490,582 in the corresponding period of the previous year. The imports for the same period were respectively valued at \$25,511,085 and \$17,721,082. The imports of iron ore in February were 101,799 gross tons, of which 49,070 tons came from Cuba, 48,579 tons from Europe, and the remainder from other countries. The imports in February, 1906, were 84,401

tons. The exports of iron ore in February were only 618 tons.

Preservative Treatment of Cross Ties.

Bulletin 74 of the Forest Service, United States Department of Agriculture, deals with the forest product of the United States in 1905. In the chapter on railroad cross ties statistics are given showing that the Southern States furnish over 38 per cent. of the ties purchased by steam railroads in 1905, while the Central States rank next, with nearly 23 per cent. Of a total of 77,981,227 hewed and sawed ties purchased in 1905, oak ties numbered 34,677,304; pine, 18,351,037; cedar, 6,962,827; chestnut, 4,717,604; Douglass fir, 3,633,276; cypress, 3,483,746; tamarack, 3,060,082; hemlock, 1,713,090. All other woods amounted to less than 1,400,000. Concerning tie preservation, the report says:

As a result of the realization that the supply of tie material was not limitless, and more especially when it was found that the durable white oak could no longer be secured in sufficient quantities to meet the demands for renewals and new track, an attempt was made to devise methods for increasing the length of service of the inferior woods. Tie plates were introduced with marked success in reducing the wear when used on soft woods. It was soon found, however, that the tie plate was not sufficient, since the wood decayed so rapidly that renewals in a short time were often necessary. To meet this problem, experiments in preservative treatments of ties were taken up by several railroad companies, some of them working in co-operation with the Forest Service, and it seems safe to predict that within a comparatively short period of time more treated than untreated ties will be used. The statistics for 1905 show that 7,510,000 ties, or nearly 10 per cent. of the total number purchased, were given a preservative treatment of some character. During 1905 at least 10 railroad companies were operating their own plants for the preservation of their construction material, and several others are contemplating the installation of such plants. In addition to the roads which treat their own timber many others have their timber treated at commercial treating plants.

McAdamite.—This is the name given to a new alloy of aluminum, zinc and copper. The maker of this metal, the McAdamite Foundries Company, 177 Broadway, New York City, claims that it is the strongest light weight metal known. The peculiar properties attributed to it are largely the result of casting in a mold which provides for the quick absorption of heat, the exact details of which are patented and not generally known. The metal is therefore not sold in ingot form, but the company will furnish castings from patterns sent by its customers. A number of different alloys under the same general name have various uses, such as for the bodies of engines for gasoline launches and as a bearing metal on engines. It is used in connection with high grade steam and air specialties. The castings, which in their finished form are about the same cost per piece as when made of brass, are noncorrosive, readily worked dry and will sustain a considerable blow. The metal has a specific gravity of 3.39, as compared with 2.56 for cast aluminum and 8.5 for high yellow brass. Experimental tests have demonstrated that it has a tensile strength of 46,000 lb. per square inch, and that it will sustain under torsion 60,000 lb. In compressive stress it fractures under a load of 126,000 lb. per square inch with a clean, even fracture at the theoretical angle of fracture 45 degrees. The metal has a high luster and is silvery in color, and it seems to offer advantages in the manufacture of ornamental builders' hardware or a variety of other uses where strength combined with lightness is desirable.

The Waelark Wire Company, New York, is to build an addition to its plant at Bayway, N. J., to increase its capacity for the drawing of copper wire. The new structure will be 53 x 203 ft., two stories, and will cost \$35,000.

NEWS OF THE WORKS.

Iron and Steel.

The Maryland Rail Company, Cumberland, Md., has just completed a new mill for the manufacture of light steel rails, which was placed in operation March 25, doubling the capacity of the plant.

G. W. McClure, Son & Co., engineers and contractors, Bessemer Building, Pittsburgh, have secured a contract from the American Steel & Wire Company, Pittsburgh, for two McClure three-pass fire brick hot blast stoves, 22 ft. in diameter by 100 ft. high to eave of roofs, to be erected at the Edith Furnace in Allegheny, Pa.

Additional capacity for drawing rods into suitable sizes for drawing down into fine wire is being made to the plant of Royle & Akin, Ossining, N. Y., to take care of the large demand for copper clad steel wire, drawn from Monnot metal.

The Pioneer Steel Company, Rockford, Ill., maker of improved soft center carbonized steel, is planning a reorganization of the company, which will involve a large increase in its capital stock to cover the requirements of its largely increased business.

The bolt factory of the Fort Worth Iron & Steel Company, Fort Worth, Texas, has resumed operations, having been restored from the recent fire. The department already has large orders on hand for immediate delivery of railroad spikes, which are in great demand by the railroad companies.

The New York State Steel Company, Buffalo, N. Y., lighted the fires in its Talbot furnaces March 30, and within the next few days the plant will be producing steel. As the blooming mill is completed the company will shortly be able to place billets on the market. The construction of the blast furnace is proceeding satisfactorily.

At Canton, Ohio, March 28, representatives of the American Vanadium Company, Pittsburgh, and of the Ford Automobile Company, Detroit, and others witnessed the taking off of the second heat of vanadium steel in the open hearth plant of the United Steel Company. The first shipment of 20 tons was recently made from Canton to the works of the Ford Automobile Company.

W. H. Oatley, president of the Rusk Iron Company, Rusk, Texas, has returned from the East, where he purchased material for refitting and operating the Star and Crescent Furnace at Rusk.

A schedule of the liabilities and assets of the Acme Wire Company, Cuyahoga Falls, Ohio, was filed in the United States District Court at Cleveland, Ohio, last week. The debts are given as \$54,310.75 and the assets \$37,374.06. The company went into bankruptcy a few weeks ago.

The Trenton Iron Company, Trenton, N. J., intends to erect two one-story brick additions to its plant for the purpose of increasing its wire production. One of the buildings will be 65 x 90 ft. and the other 83 x 130 ft.

The Hamilton Steel & Iron Company, Hamilton, Ont., for which Frank C. Roberts & Co., Philadelphia, Pa., are building a new 300-ton blast furnace, expects that the stack will be ready for operation some time in July. The company is also adding another 30-ton open hearth furnace, which is being erected by Alexander Laughlin & Co., Pittsburgh, Pa.

A slip occurred last week at Mary Furnace of the Ohio Iron & Steel Company, Lowellville, Ohio, which killed two men and will keep the furnace idle for a week or 10 days until repairs have been made.

Reports that the Midland Steel Company, operating a blast furnace at Midland, Beaver County, Pa., had been taken over by the Jones & Laughlin Steel Company, Pittsburgh, have been officially denied.

The new skelp mill being erected by the Youngstown Sheet & Tube Company, Youngstown, Ohio, is about completed and will probably start this week. The mill is designed for rolling the smaller sizes of skelp.

A large power house to be built of brick will be erected at the Ohio Works of the Carnegie Steel Company, Youngstown, Ohio. Included in the equipment will be four horizontal gas engines of the latest type, contract for which has been awarded to the Snow Steam Pump Company, Buffalo, N. Y. The two blast furnaces to be built at the Ohio Works, work on which has already been started, will be driven by four horizontal gas engines, to be built by the William Tod Company, Youngstown, Ohio.

The William Tod Company, Youngstown, Ohio, has received a contract for three blowing engines, to furnish blast for the two new blast furnaces to be built by the Youngstown Sheet & Tube Company. These engines will be driven by a battery of 20 boilers having a capacity of 2400 hp. Waste gas from the blast furnaces will be used as fuel for the boilers.

General Machinery.

The Johnson Concrete Machine Company, Sioux City, Iowa, with a capital of \$10,000, has been organized to manufacture

the Warren concrete block machine. L. S. Johnson is president and C. W. Johnson secretary and treasurer.

The Industrial Works, Bay City, Mich., has purchased a plot of ground upon which it will build an addition, 130 x 250 ft., which will afford the company a considerable increase in capacity.

At New Albany, Miss., Homer Smith has purchased the lot and buildings formerly owned by the Dixie Machine Shops, has erected more buildings and will operate an up to date machine and repair plant.

Plans for an addition to the car building department of the Nashville, Chattanooga & St. Louis Railroad shops are being considered at Nashville, Tenn. The proposed work will cost approximately \$50,000. With the addition contemplated 10 cars per day could be turned out. At present the capacity is only three cars per day.

The Union Iron Works, Houston, Texas, has just completed a carload of 10½ x 12 in. drilling machines for the Texas Company, Sour Lake, the first ever manufactured in Texas. The capital stock has been increased from \$75,000 to \$150,000.

H. J. Koontz, manufacturers' agent, Pittsburgh, has recently made sales as follows: To the Fifth-Sterling Steel Company, a 15 x 100 ft. standpipe and nine 6000-gallon oil storage tanks; H. C. Frick Coke Company, air compressor; Alabama Construction Company, locomotive revolving crane; Fair Haven Iron Ore Company, McMyler crane; Atlantic Refining Company, two automatic steam engines; Keystone Driller Company, 100-hp. gas engine, 75-kw. generator; Latrobe Ice & Provision Company, two 250-hp. boilers, and to the Oklahoma Iron Works, one 5-ft. Bickford radial drill and a 12-ft. planer.

The Brown & Zortman Machinery Company, Pittsburgh, states that its loss by the recent fire was very small. This company now occupies its new offices, warehouse and salesrooms, 2531-2545 Liberty avenue, Pittsburgh, having given up its former offices and salesrooms in the Conestoga Building. The new location is above the highest flood stage and affords more room to accommodate a larger stock of machinery, as well as to care for its constantly growing business.

Power Plant Equipment.

The Henry Goldner & Son Company, Philadelphia, Pa., is to replace its buildings, which were recently destroyed by fire, with a structural iron smith shop 50 x 80 ft., and an engine and boiler room 25 x 50 ft.

Harry Darby, owner of the Missouri Boiler Works, Kansas City, Mo., has purchased property at Third street and Minnesota avenue for a new boiler works plant. Work on the buildings will begin within 10 days.

An increase in capital stock of \$10,000,000 has been voted by the stockholders of the Washington Power Company, Spokane, Wash., owner of the principal electric system in that city, for the betterment and extension of its plant.

The new power house of the Edison Electric Company, Los Angeles, Cal., on the Kern River, is nearing completion. The initial electric generating equipment provides for an output of some 20,000 kw. The power will be transmitted to Los Angeles and to Santa Barbara. Four General Electric 5000-kw. three-phase 50-cycle generators have been installed. These large machines are water wheel driven at 250 rev. per min., delivering current at a potential of 2300 volts to the secondaries of the transformers. Each of the 13 transformers has a capacity of 1667 kw., the primaries being arranged with taps to provide for Y connections at several different potentials, the highest being 75,000 volts and the lowest 33,000 volts. The secondary windings are arranged for delta connection at 2300 volts.

The N. C. Davison Company, manufacturers' agent, Empire Building, Pittsburgh, has received a contract from the National Tube Company for four large electric quintuplex power pumps, motor driven, having a capacity of 150 gallons per minute against 1100 lb. pressure. These pumps will be made by the Allentown Rolling Mills, Allentown, Pa., and will be installed in the National Department of the National Tube Company at McKeesport, Pa., for testing pipe. They are said to be the largest pumps of this kind ever built and contain some special features. The company has also received an order for a 20-hp. Bessemer gas engine to be installed in the Allegheny, Pa., plant of the Steel City Electric Company.

The affairs of the Enterprise Boiler Company, Youngstown, Ohio, are being wound up, the machinery is being sold, and the company will retire from business.

Foundries.

The American Cast Iron Pipe Company, Birmingham, Ala., is about completing its second foundry, which is built specially for the manufacture of heavy castings. It is expected to be in full operation by May 1.

The Atlanta Pipe & Foundry Works, Atlanta, Ga., has organized with a capital stock of \$10,000, to manufacture cast iron pipe and castings. The incorporators are James E. Belcher, Ed. L. Humphrey and W. L. Scott.

The Fort Pitt Steel Casting Company, McKeesport, Pa., maker of small steel castings exclusively, has recently made

several additions to its plant and is now building an addition, 25 x 60 ft., to its pattern house. This company has orders for steel castings sufficient to take its output for some months ahead.

At New Orleans, La., the Sutton Foundry has begun building a new foundry building on land recently purchased at St. Andrew and Rousseau streets.

The Chattanooga Iron & Steel Company, Chattanooga, Tenn., has been organized with a capital stock of \$125,000, by Gary Schutte, Simon Muniskin, Edward Muniskin, C. G. Nell and F. F. Smith.

The Shull Steel Castings & Mfg. Company, recently organized at Canton, Ohio, has let the contract for its main shop buildings to the Interstate Engineering Company, Bedford, Ohio. The company announces that its plant will include a main structure, 60 x 240 ft., and two lean-tos, one 32 x 240 ft. and the other 34 x 75 ft. Construction work is expected to begin May 1, and it is the intention to have the plant in operation by July 15. The equipment will include four electric traveling cranes. The plans provide for one 10-ton open hearth furnace. E. G. Van Horn is manager and treasurer of the company.

An addition, 32 x 90 ft., is to be built to the foundry and blacksmithing department of Girard College, Philadelphia, Pa.

The General Castings Company, Verona, Pa., has built extensions to its furnace building and finishing shop and a new core shop. An additional open hearth furnace has been installed, also one new 30-ton and one 10-ton electric traveling crane and additional power equipment.

The Scottsdale Foundry & Machine Company, Scottsdale, Pa., is operating its plant to full capacity, a large portion of its business being with the various steel plants in the Pittsburgh District. The company is also doing considerable work for coal mines in the way of cages and plate steel tippie rigs. It is also having a large demand for electric coke oven charging larries, which is one of its principal specialties, and its sales in this line promise to be very large this year.

Motors and Small Engines.

The Turner-Fricke Company has succeeded the Keystone Engineering Company, with offices in the Farmers' Bank Building, Pittsburgh. The new company will erect a plant at Sharon, Pa., to manufacture gas engines.

Fires.

The shops of the El Paso & Southwestern Railroad at Carizzo, N. M., were destroyed by fire March 28, the loss being about \$100,000.

On March 27 the plant of the John H. Murphy Boiler Works, Alexandria, La., was damaged \$8000 by fire.

The Bayside Iron Works, Everett, Wash., was damaged \$20,000 by fire March 23.

The machine shop of Willis H. Dutton, Morristown, N. J., was badly damaged by fire March 24.

The piano factory of the H. Schulz Company, Chicago, Ill., was almost totally destroyed by fire March 27, the loss being about \$50,000.

The plant of the Maryland Car Wheel Company, South Baltimore, Md., was destroyed by fire March 30, the loss being about \$60,000.

The plant of the Magnolia Stove Works, Memphis, Tenn., was damaged \$50,000 by fire March 29.

Hardware.

The business of Cobb & Drew, Plymouth, Mass., has been incorporated under the style of Cobb & Drew, Incorporated, and not as Cobb & Drew Company, as noted in our last issue. The company will continue to manufacture rivets, burrs, washers, tacks, nails, staples, double pointed tacks, spring cotters and spring keys.

The Bryan Mfg. Company, Bryan, Ohio, has recently received good sized orders for wheelbarrows for shipment to Buenos Ayres, Peru and Ecuador, South America.

The Ross Stamping Company has been organized at Elyria, Ohio, with a capitalization of \$30,000, to manufacture the Ross shovel. The incorporators are D. W. Donaldson, W. W. Hoffman, J. C. Ross, W. G. Sharp and E. R. Bachman.

Plans for five new buildings and additions to be erected by the Carnahan Stamping & Enameling Company, Canton, Ohio, are being prepared. The new buildings will include a 60 x 90 ft. one-story concrete structure for the branding and smelting departments and a chemical storehouse, a 50 x 75 ft. brick one-story addition to the present machine shop, two frame warehouses and a frame box factory. The company has already let contracts for six new furnaces. The additions will give the company an increased capacity of between 40 and 50 per cent.

C. E. Sovereign Company, Rockford, Ill., reports that it has added a quantity of new machinery for making its XL axle washers, and will materially increase its output for the current year.

The Wallace Barnes Company, Bristol, Conn., manufacturer of steel clock springs and other spring specialties, is now equipping its new factory, which was recently completed. The

building is four stories, 40 x 140 ft., and will provide 22,000 sq. ft. of new floor space. The company has also erected a two-story brick die shop, 25 ft. square.

The Middletown Silver Company, Middletown, Conn., is building an addition to its plant, 18 x 80 ft., to be devoted to power house and casting room.

The Russell Jennings Mfg. Company is moving its offices from Deep River to Chester, Conn., where a new building has been erected for the purpose. Very commodious modern quarters have been provided in a building 30 x 50 ft. and two stories. The first floor will be devoted to the main office and shipping and stock rooms, and on the second floor will be the directors' room, packing and storage rooms. The change in location marks another step in the history of an old and widely known manufacturing establishment. The business was established in 1837 by Stephen Jennings, and from 1855 a specialty has been made of the extension lip auger bit, the invention of Russell Jennings, which has achieved a worldwide reputation. The present officers of the company are: President, Stephen E. Jennings; vice-president, Arthur L. Jennings; secretary, Ernest A. Jennings; treasurer and general manager, William A. Bothwell; superintendent forging department, Samuel R. Shaler; superintendent finishing department, Henry F. Shaler.

Appleton Mfg. Company, Batavia, Ill., manufacturer of agricultural implements, farm machinery, windmills, &c., has recently been obliged to enlarge its plant. By raising one department from one story to three 34,400 ft. of added floor space has been secured.

Champion Tool & Handle Company, Ewart, Mich., manufacturer of the well-known line of Champion lumbering tools, will remodel its plant this spring and put in a new gas producing plant.

The Birmingham Novelty Works, Thomas Purvis, proprietor, has finished a new building at Twenty-eighth avenue and Twenty-third street, North Birmingham, Ala., and the machinery is now in full operation. The Perfection patent revolving self-heating sad iron and the Johnson automatic burglar alarm and lock are manufactured. Also high class foundry and machine work and all kinds of nickel and brass plating.

The U. S. Hame Company, Buffalo, N. Y., is adding to its plant on Ontario street a foundry building of frame, concrete and corrugated iron.

The Dahlstrom Metallic Door Company, Jamestown, N. Y., which is now erecting an addition 64 x 135 ft. in size and four stories in height to its factory, has decided to add another building 64 x 160 ft., of four stories, which will nearly triple the capacity of the original plant.

The Taylor Tire Company, 525 Main street, Springfield, Mass., has been organized to manufacture a patent tire. It is planned to begin manufacturing in a short time. S. L. Taylor is the president, T. C. Beach treasurer and William S. Bellows clerk.

The Waltham Clock Company, Waltham, Mass., has purchased a lot of land containing about 25,000 sq. ft., upon which it plans to erect a new factory building, though it is not decided when the work will begin. It will be a three-story building, with basement, and of either concrete or brick. Its capacity will be from 100 to 200 hands. It will be designed so that extensions may be made from time to time as needed.

Miscellaneous.

The firm of Richey, Brown & Donald, Brooklyn, N. Y., architectural iron, brass and bronze work, has incorporated under the same name with a capital stock of \$300,000. A. S. Richey is president, R. B. Brown vice-president, and Joseph D. Donald secretary and treasurer.

The Kilby Frog & Switch Company, Birmingham, Ala., has increased its capital stock from \$80,000 to \$150,000.

The Alabama Fuel & Steel Company, Birmingham, Ala., organized about a year ago, is opening six coal mines under the direction of H. F. DeBardeleben, pioneer developer of the Birmingham District, preliminary to the working of its large holdings of iron ore. The president is J. M. Overton; vice-president, H. F. DeBardeleben; treasurer, Edgar Jones; Secretary, Overton Fulton, and general sales agent, J. R. McWane.

The Ohio Ceramic Engineering Company, Cleveland, Ohio, is in the market for some rolled steel doors for its new plant.

The Waterbury Rolling Mills, Incorporated, Waterbury, Conn., will begin business April 1 with a well equipped casting shop and mill for the manufacture of sheet German silver, sheet brass and sheet bronze. The active management of the company is in the hands of experienced men, who have long been connected with the brass and silver trade in Waterbury. The casting shop will be in charge of Frank P. Welton, the mill superintendent is Robert D. Somers and William D. Martin will be the general manager. All were formerly with the Benedict & Burnham Mfg. Company, Waterbury. A. H. Wells is the president; A. Kenworthy, vice-president; Frank P. Welton, treasurer, and Fred D. Beardsley, secretary and assistant treasurer.

The Niagara Falls Pulp Board Company, recently incorporated at Niagara Falls, N. Y., with a capital of \$300,000,

will erect a plant and equip it with machinery for the manufacture of wood pulp board. F. F. Nye, Morris Cohn, Jr., and N. J. Bowker, Niagara Falls, are the incorporators.

The Gustafson Mfg. Company, Chattanooga, Tenn., is putting in new special woodworking machinery in the department devoted to the building of mine cars.

Several errors were made in a recent item printed relating to the Duer Spring & Mfg. Company, Pittsburgh. The concern was referred to as the Duer-Elderkin Spring & Mfg. Company, but Mr. Elderkin has not been connected with the company for about a year. The correct name is the Duer Spring & Mfg. Company, and it manufactures large and small springs of every description, except elliptic springs for vehicles and locomotives.

A Pennsylvania charter has been granted to the Newell Engineering Company, 905-906 Empire Building, Pittsburgh, the directors being Hugh T. Newell, John H. Newell and Norwood Johnston. The company will engage in industrial engineering for pipe mills, steel plants, glass works, steel casting plants and malleable iron works, &c.

The American Can Company has placed contracts for its new factory to be located at New Castle, Pa. Only one building will be erected now, this to be 500 ft. long and 90 ft. wide. Another smaller building will be erected later in the spring, and two more at a future time. It is expected to have the plant in operation in the summer, so that cans may be made for the fall canning season. Bright plate for the new factory will be furnished by the Shenango and Greer works of the American Sheet & Tin Plate Company at New Castle.

The Sloss-Sheffield Steel & Iron Company's Report.

The income account of the Sloss-Sheffield Steel & Iron Company for its fiscal year ending November 30, 1906, is given as follows in the company's seventh annual report, in comparison with the previous year:

	1906.	1905.
Gross sales and earnings.....	\$6,290,014	\$5,747,075
Operating expenses, taxes and maintenance, &c.....	4,938,268	4,181,838
Net earnings.....	\$1,351,746	\$1,565,237
Fixed charges.....	210,000	210,000
Balance.....	\$1,141,746	\$1,355,237
Depreciation.....	140,902	150,157
Balance.....	\$1,000,844	\$1,205,080
Dividend, preferred.....	\$469,000	\$469,000
Dividend, common.....	500,000	375,000
Total dividend.....	\$969,000	\$844,000
Carried to surplus.....	31,843	361,080

The balance sheet for the year ending November 30, 1906, makes the following showing:

Resources.	
Property account.....	\$21,257,965.39
Treasury securities.....	244,218.11
Stocks and bonds of other companies.....	392,557.17
Cash, bills and accounts receivable.....	1,478,852.48
Supplies, raw and finished material at cost.....	400,148.04
Stocks in company's stores and warehouses at cost.....	148,087.62
Extraordinary repair and renewal fund.....	82,850.26
Insurance and taxes unexpired.....	6,228.29
Total.....	\$24,010,907.36
Liabilities.	
Capital stock, preferred.....	\$6,700,000
Capital stock, common.....	10,000,000
Sloss Iron & Steel Company:	\$16,700,000.00
Mortgage 6 per cent. bonds, 1920.....	\$2,000,000
Mortgage 4½ per cent. bonds, 1918.....	2,000,000
Current accounts.....	459,688.74
Pay rolls (current month).....	99,591.46
Bills payable.....	000.00
Profit and loss.....	2,751,627.16
Total.....	\$24,010,907.36

From President J. C. Maben's accompanying remarks to the stockholders the following extracts are taken:

"In our last annual report, reference was made to the unprecedented production and consumption of iron in this country, when the production was thought to be about the limit of our ability to produce. The production for the past year, however, shows a still further increase of 2,300,000 gross tons over that of the previous year, and still the consumptive capacity at work seems to have increased even greater than the production, as evidenced by the sharp advance in prices, the premium paid for spot iron, and the importation of a considerable amount of iron from Europe. During last year the price of No. 2 iron at Birmingham advanced from \$13.50 in June and

July to \$15.50 by September, which price continued to be maintained for deliveries during the first half of 1907, and in December the price was further advanced to \$19 for deliveries during the third and fourth quarters of 1907, while iron for prompt delivery brought from \$3 to \$4 per ton more.

"Alabama did not share proportionately in the great increase in the production of iron, having produced only about 70,000 tons more than in 1905, when a strike of the miners at the coal mines of all the furnace companies but one in the Birmingham District more seriously interfered with the operation of the furnaces than during last year. The failure of Alabama to show a proportionate increase in production must be attributed somewhat to the scarcity of labor, but more largely to the failure of some of the railroads to handle the raw material for the furnaces. The labor situation was somewhat improved during the year, but some of the railroads seemed less able to handle their business than during the previous year, and our furnaces were frequently banked for from a few hours to a day for the want of coke, when train loads of it were standing on sidings within a few hours' run of the furnaces, which, despite our every effort, it seemed impossible to get placed in time. This, of course, decreased our output of iron, added to the cost, and produced bad working of the furnaces.

"The problem of handling the furnace material in this State, as well as other freights, is a serious one, for while the railroads are beginning to realize that additional facilities must be provided, adverse legislation, both national and State, is rendering it difficult for the railroad companies to secure the money necessary to make these improvements.

"The furnaces of the company produced 31,000 tons less iron than in 1905, while the output of coal fell off 90,000 tons and that of coke 20,000 tons, which must be attributed entirely to the causes before enumerated. The profits of the year were further curtailed by the failure to secure cars for the shipment of pig iron, which forced us to carry over into the present year a large tonnage. Altogether, last year was a most trying one in many ways, certainly for those in the iron and steel business in the South, and it would seem that the South, at least, was undertaking to handle more business than can be done profitably. A striking illustration of this is the heavy increase in gross earnings of many of the railroads, and the large decrease in net earnings.

"Your company earned about \$200,000 less than in 1905, although the delivery price of iron averaged 85 cents a ton more, which was due to the higher cost, caused to a great extent by our inability to get the railroad service which we should have had. The marked advance in the price of iron did not take place until about the close of the fiscal year, and as the company had sold large amounts of iron for future delivery at prices prevailing during the earlier months of the year, the average price of our deliveries during the year was below \$13.

"The strike of our coal miners, which continued for over two years, was officially declared off last August, and the mines are now being operated on the open shop basis.

"The working capital shows a decrease of a little over \$200,000, which must be accounted for by the large amounts spent during the year in opening new coal and ore mines (\$183,000 having been spent on one coal mine), improving furnaces, providing additional equipment in the way of steam shovels, dinkey locomotives and large side dump tram cars for the brown ore mines at Russellville and paying for the one-third interest in the North Alabama Furnace Company. As no new securities are issued to meet the payments for such improvements they must be paid out of earnings or working capital. The latter is still more than ample for all the requirements of the company, and more than double the amount provided and thought to be much more than sufficient, at the time the company was organized. During the year the company bought the one-third interest owned by outside parties in the North Alabama Furnace Company, including the bonds, so that we now own all of the bonds and the entire capital stock of that company."

The Iron and Metal Trades

In its ultimate analysis the financial situation dominates the future of the iron trade for the second half. By far the greatest part of the orders now on the books, notably those coming from the railroads, were financed long ago and will go through; but the troubling question is what requirements will come up when the work in hand is delivered. The trade will welcome some slackening, but is really nervous over the danger that the demand may sink below the normal. The hysterics of the railroads should be discounted; on the other hand, the flat-footed denials that there have been no cancellations and no withholding of specifications should be accepted with reserve.

The Pig Iron markets have been rather quiet in all the principal distributing and primary markets, and there are some indications of easing prices. Buyers are again beginning to be highly critical of quality, which is usually one of the earliest indications of a desire to claim adjustments. Deliveries are beginning to be better, and cases are cropping up where prices recently ruling firm for later deliveries are being accepted for earlier deliveries. Spot Iron, while not as scarce as it was, still commands a handsome premium.

The Steel Corporation has exercised its option for 15,000 tons of May Bessemer Pig. A lot of 9000 tons of Bessemer Pig for the second half has been sold at \$21, Valley furnace.

The 5000-ton lot of Chinese Basic Pig offered last week has been purchased by a leading firm of Pig Iron merchants.

The Ferromanganese market is in an unsettled condition. It turns out that some of the business referred to last week was done at considerably less than \$67, and that to-day less than \$65 would be accepted.

In the Central West Steel continues exceedingly scarce. One large interest could use 1000 tons daily for the next two months, and another has sought in vain to purchase round quantities of Steel and of Skelp for April and May delivery.

In the heavier lines comparatively little new business has been closed. The largest Rail order reported is 5000 tons for the Norfolk & Western. One leading Western line is in the market for 21,000 tons. The large orders for South America have not yet been closed.

It is estimated that the total tonnage of Structural Material placed during March was between 90,000 and 100,000 tons, of which the American Bridge Company took 42,000 tons. There is pending now an aggregate of about 100,000 tons, for which bids are in. During the week 4000 tons were ordered for the Columbia River Bridge and 3000 tons for the Erie.

To some of the Eastern Plate mills specifications are coming in rather slowly of late. The United States Steel Corporation has put out inquiries for about 8000 Steel cars, of which 5000 cars are for the lines in the Chicago District.

In the lighter lines the heavy pressure for deliveries continues unabated. The American Sheet & Tin Plate Company cannot promise deliveries on Galvanized Sheets inside of 24 weeks, on Blue Annealed Sheets 20 weeks, and on Box Annealed Sheets 18 to 19 weeks.

The leading interest has opened its books for Tin Plate for the third quarter at \$3.90, and is taking a good many orders at that figure.

There has been a decline in the Copper market. Electrolytic has sold during the week at 24½c. and Casting Copper at considerably below that figure.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

FIG IRON, Per Gross ton:	Apr. 3, 1907.	Mar. 27, 1907.	Mar. 6, 1907.	Apr. 4, 1906.
Foundry No. 2, Standard, Philadelphia	\$24.50	\$24.25	\$25.25	\$18.25
Foundry No. 2, Southern, Cincinnati	26.00	26.00	26.00	16.50
Foundry No. 2, Local, Chicago	26.00	26.00	25.50	18.75
Bessemer, Pittsburgh	22.85	22.85	22.85	18.20
Gray Forge, Pittsburgh	21.60	21.60	21.85	16.60
Lake Superior Charcoal, Chicago	26.50	26.50	27.00	19.50

BILLETS, &c., Per Gross Ton:	30.00	29.00	29.00	27.00
Bessemer Billets, Pittsburgh	30.00	36.00	36.00	32.00
Open Hearth Billets, Phila.	31.50	32.00	33.00	29.00
Wire Rods, Pittsburgh	37.00	37.00	37.00	34.00
Steel Rails, Heavy, Eastern Mill	28.00	28.00	28.00	28.00

OLD MATERIAL, Per Gross ton:	18.00	18.00	18.00	13.50
Steel Rails, Melting, Chicago	19.00	19.25	19.50	17.00
Iron Rails, Chicago	25.00	25.00	25.00	20.50
Iron Rails, Philadelphia	27.00	27.00	27.00	21.50
Car Wheels, Chicago	25.00	24.00	23.50	18.00
Car Wheels, Philadelphia	24.00	24.00	23.25	16.75
Heavy Steel Scrap, Pittsburgh	18.00	18.00	18.00	14.50
Heavy Steel Scrap, Chicago	16.00	16.00	16.00	13.50
Heavy Steel Scrap, Philadelphia	18.75	18.75	19.00	16.75

FINISHED IRON AND STEEL, Per Pound:	1.93½	1.93½	1.93½	1.73½
Refined Iron Bars, Philadelphia	1.81½	1.81½	1.81½	1.71½
Common Iron Bars, Chicago	1.80	1.80	1.80	1.60
Common Iron Bars, Pittsburgh	1.74½	1.74½	1.74½	1.64½
Steel Bars, Tidewater, New York	1.60	1.60	1.60	1.50
Tank Plates, Tidewater, New York	1.84½	1.84½	1.84½	1.74½
Tank Plates, Pittsburgh	1.70	1.70	1.70	1.60
Beams, Tidewater, New York	1.84½	1.84½	1.84½	1.84½
Beams, Pittsburgh	1.70	1.70	1.70	1.70
Angles, Tidewater, New York	1.84½	1.84½	1.84½	1.84½
Angles, Pittsburgh	1.70	1.70	1.70	1.70
Skelp, Grooved Steel, Pittsburgh	1.90	1.90	1.90	1.57½
Skelp, Sheared Steel, Pittsburgh	2.00	2.00	2.00	1.60

SHEETS, NAILS AND WIRE, Per Pound:	2.50	2.50	2.50	2.25
Sheets, No. 27, Pittsburgh	2.00	2.00	2.00	1.85
Wire Nails, Pittsburgh	2.05	2.05	2.05	1.80
Cut Nails, Pittsburgh	2.45	2.45	2.45	2.30
Barb Wire, Galv., Pittsburgh				

METALS, Per Pound:	24.50	25.25	25.25	18.62½
Lake Copper, New York	6.85	6.85	6.95	6.10
Spelter, New York	6.65	6.65	6.80	6.00
Spelter, St. Louis	6.25	6.25	6.35	5.85
Lead, New York	6.05	6.05	6.10	5.25
Lead, St. Louis	40.00	40.35	41.90	38.25
Tin, New York	23.00	23.00	23.50	18.00
Antimony, Hallett, New York	45.00	45.00	45.00	40.00
Nickel, New York	\$4.09	\$4.09	\$4.09	\$3.69
Tin Plate, 100 lb., New York				

Chicago.

FISHER BUILDING, April 3, 1907.—(By Telegraph.)

Throughout the list of Finished Material there are no disturbing features apparent. Specifications are being freely furnished, and in spite of the fact that in many lines early deliveries cannot be had from the principal mills, a reasonable amount of new business is still being booked. Stories of cancellation in this market are emphatically denied. A considerable tonnage of Structural Shapes for building is in sight, and it is estimated that not less than 30,000 tons for new Chicago structures will be in the market within a few weeks. Analysis of the situation in the Pig Iron market is rather difficult because of different attitudes assumed by the various interests. Notwithstanding the little interest shown by buyers in purchases for second half requirements and the practical cessation of any considerable inquiries covering that period, the principal Southern furnace interests have not shown a disposition to make concessions in price, quotations with rare exceptions being still firm, at \$18.50 to \$19, Birmingham, for third and fourth quarters. Sellers claim that a considerable shortage exists in users' requirements for second quarter and are looking for early inquiries on this tonnage by the rapid movement of stocks from Southern furnace yards. Following the decided improvement in car service, the acute shortage in Foundry stocks has been measurably relieved. At the same time an oversold condition of furnace schedules is disclosed, and it is now evident that inadequate shipping facilities were not the sole cause of retarded deliveries. It is claimed by the roads that 300,000 tons of Iron has been moved from the

Birmingham District within 60 days. This tonnage is largely in excess of normal shipments and represents a considerable amount of waiting iron. At the meeting held by managers of the Southern roads at Louisville last week it was determined that in view of the progress made in the movement of delayed shipments no further postponement of the proposed 25c. advance schedule to take effect April 1 would be authorized, and the rate now effective on Pig Iron from Birmingham to Chicago is \$4.35 per ton.

Pig Iron.—A marked improvement in car service and shipping facilities from the Southern furnaces has resulted in the movement of a large amount of delayed iron, and depleted foundry stocks are in consequence being replenished by the receipt of long overdue material. The effect of these shipments is manifest in a falling off of spot orders, which are this week not nearly so plentiful. With the forward movement of old orders it is not likely that the high prices ruling on spot iron will continue, but no appreciable change has up to this time taken place, \$25.50 to \$26 being obtained for small lots. Not since prices reached the present high level has trade been as quiet locally as it now is. The business moving is mostly confined to small lots for prompt delivery, and there are but few sales or inquiries for second half iron. Considering the continued refusal of buyers to come in on present prices, the furnace interests exhibit a remarkable degree of firmness, which, so far as the principal factors in both Northern and Southern Irons are concerned, has not been shaken. While \$19, Birmingham, for No. 2 Foundry is still held by one of the leading companies, and \$18.50, it is affirmed, is not shaded by other leading interests for last half delivery, it is nevertheless true that a lot of 1800 tons of No. 2 Southern Foundry was last week sold for that period at \$18, Birmingham. A sale of 1000 tons of Basic at \$19, Birmingham, for third or fourth quarters is reported. Northern Foundry is unchanged, \$23.50 and \$24.50 being asked for second half. The following quotations are for April, May and June shipments, f.o.b. Chicago:

Lake Superior Charcoal.....	\$26.50 to \$27.00
Northern Coke Foundry, No. 1.....	26.50 to 27.00
Northern Coke Foundry, No. 2.....	26.00 to 26.50
Northern Coke Foundry, No. 3.....	25.50 to 26.00
Northern Scotch, No. 1.....	26.00 to 27.00
Ohio Strong Softeners, No. 1.....	26.00 to 26.50
Ohio Strong Softeners, No. 2.....	25.50 to 26.00
Southern Coke, No. 1.....	26.35 to 27.10
Southern Coke, No. 2.....	25.85 to 26.35
Southern Coke, No. 3.....	25.35 to 25.85
Southern Coke, No. 4.....	24.85 to 25.35
Southern Coke, No. 1 Soft.....	26.35 to 26.85
Southern Coke, No. 2 Soft.....	25.85 to 26.35
Southern Gray Forge.....	21.85 to 22.35
Southern Mottled.....	21.85 to 22.35
Malleable Bessemer.....	26.50 to 27.00
Standard Bessemer.....	25.30 to 25.80
Jackson Co. and Kentucky Silvery, 6 %	30.30 to 30.80
Jackson Co. and Kentucky Silvery, 8 %	32.30 to 32.80
Jackson Co. and Kentucky Silvery, 10 %	34.30 to 34.80

Metals.—Nothing beyond the usual number of small orders for current requirements in Copper is reported. Quotations on business of this character have not changed. Other Metals are in good demand. Spelter is firm and scarce. We quote as follows: Casting Copper, 26½c. to 27c.; Lake, 27c. to 27½c., in car lots for prompt shipment; small lots, ¼c. to ½c. higher; Pig Tin, car lots, 43¼c.; small lots, 44¼c.; Lead, Desilverized, 6.50c. to 6.60c., for 50-ton lots; Corroding, 7.25c. to 7.35c., for 50-ton lots; on car lots, 2¼c. per 100 lb. higher; Spelter, 7¼c.; Cookson's Antimony, 28¼c., and other grades, 26½c. to 27½c.; Sheet Zinc is \$8.50 list, f.o.b. La Salle, in car lots of 600-lb. casks. On Old Metals we quote: Copper Wire, 19c.; Heavy Copper Wire, 19c.; Copper Bottoms, 18c.; Copper Clips, 18¼c.; Red Brass, 18¼c.; Red Brass Borings, 16¼c.; Yellow Brass, 15¼c.; Yellow Brass Borings, 13¼c.; Light Brass, 12¼c.; Lead Pipe, 5.25c.; Tea Lead, 4¼c.; Zinc, 4¼c.; Pewter, No. 1, 25c.; Tin Foil, 31¼c.; Black Tin Pipe, 27¼c.

(By Mail.)

Billets and Rods.—Rods are unchanged, both as to price and the condition of scarcity, that makes transactions of note few and far between. For such lots as are moving \$36 to \$37 are about the prices that continue to rule. Forging Billets are still quoted at \$38 and upward, according to size, but no sales of considerable tonnage are reported.

Rails and Track Supplies.—Two inquiries for Standard Section Rails, one for 20,000 and the other 3500 tons, for 1908 delivery, are reported in the market, though closure in either case has not resulted. There is a fairly strong demand for Light Rails, but Western mills are well filled up and deliveries are retarded. We quote as follows: Angle Bars, accompanying Rail orders, 1907 delivery, 1.65c.; car lots, 1.90c. to 1.95c.; Spikes, 2.40c. to 2.50c., according to delivery; Track Bolts, 2.75c. to 2.85c., base, Square Nuts, and 2.90c. to 3c., base, Hexagon Nuts. The store prices on Track Supplies range from 0.15c. to 0.20c. above mill prices. Light Rails, 30 to 45 lb. sections, \$35; 25-lb., \$36; 20-lb., \$37; 16-lb., \$38; 12-lb., \$39, f.o.b. mill. Standard Sections, \$28, f.o.b. mill, full freight to destination.

Structural Material.—Specifications are being furnished in undiminished volume and various interests affirm

that none of the talked of cancellations have taken place in this market. An order has been placed for 900 tons by the International Harvester Company for additions to its works at South Chicago. It is estimated that new work in and about Chicago, requiring 30,000 tons of Structural Material, is on the way, most of which will reach the contract stage within a few weeks. Prices from store are quoted without change, at 2.05c. to 2.10c., and mill prices are as follows: Beams and Channels, 3 to 15 in., inclusive, 1.86½c.; Angles, 3 to 6 in., ¼-in. and heavier, 1.86½c.; larger than 6 in. on one or both legs, 1.96½c.; Beams, larger than 15 in., 1.96½c.; Zees, 3 in. and over, 1.86½c.; Tees, 3 in. and over, 1.91½c., in addition to the usual extras for cutting to extra lengths, punching, coping, bending and other shop work.

Plates.—No change has occurred in the Plate situation, and but few mills are still in position to furnish shipment short of six weeks. Prices for anything like reasonably quick delivery are held from \$1 to \$4 a ton over the ruling quotations of 1.70c., Pittsburgh. We quote for future deliveries as follows: Tank Plate, ¼-in. and heavier, wider than 6¼ and up to 100 in. wide, inclusive, car lots, Chicago, 1.86½c. to 2.06½c.; 3-16 in., 1.96½c. to 2.16½c.; Nos. 7 and 8 gauge, 2.01½c. to 2.21½c.; No. 9, 2.11½c. to 2.31½c.; Flange quality, in widths up to 100 in., 1.96½c. to 2.06½c., base, for ¼-in. and heavier, with the same advance for lighter weights; Sketch Plates, Tank quality, 1.96½c. to 2.16½c.; Flange quality, 2.06½c. Store prices on Plates are as follows: Tank Plate, ¼-in. and heavier, up to 72 in. wide, 2.20c. to 2.30c.; from 72 to 96 in. wide, 2.30c. to 2.40c.; 3-16 in., up to 60 in. wide, 2.30c. to 2.40c.; 72-in. wide, 2.55c. to 2.65c.; No. 8, up to 60 in. wide, 2.35c. to 2.45c.; Flange and Head quality, 0.25c. extra.

Sheets.—Instead of showing improvement, deliveries on Galvanized Sheets are becoming more and more extended, and the American Sheet & Tin Plate Company is not now promising shipment much short of 26 weeks. Black Sheets from the same source, while not so badly congested, are delayed from 14 to 16 weeks. This condition has resulted in a large demand from store stocks. We quote as follows: Blue Annealed, No. 10, 2.01½c.; No. 12, 2.06½c.; No. 14, 2.11½c.; No. 16, 2.21½c.; Box Annealed, Nos. 17 to 21, 2.51½c.; Nos. 22 to 24, 2.56½c.; Nos. 25 and 26, 2.61½c.; No. 27, 2.66½c.; No. 28, 2.76½c.; No. 29, 2.86½c.; No. 30, 2.96½c.; Galvanized Sheets, Nos. 10 to 14, 2.81½c.; Nos. 15 and 16, 3.01½c.; Nos. 17 to 21, 3.16½c.; Nos. 22 to 24, 3.31½c.; Nos. 25 and 26, 3.51½c.; No. 27, 3.71½c.; No. 28, 3.91½c.; No. 30, 4.41½c.; Sheets from store: Blue Annealed, No. 12, 2.30c.; No. 14, 2.35c.; No. 16, 2.45c.; Box Annealed, Nos. 18 to 21, 2.70c.; Nos. 22 to 24, 2.75c.; No. 26, 2.80c.; No. 27, 2.85c.; No. 28, 2.95c.; No. 30, 3.35c.; Galvanized from store: Nos. 10 to 20, 3.30c. to 3.35c.; Nos. 22 to 24, 3.55c. to 3.60c.; No. 26, 3.65c. to 3.70c.; No. 27, 3.85c. to 3.95c.; No. 28, 4.15c.; No. 30, 4.65c. to 4.70c.

Bars.—Specifications on existing contracts for Steel Bars have in nearly every instance been completed, and in a large number of cases tonnages have been overspecified. Some new contracts of considerable tonnage are being placed by jobbers and manufacturers, on which present prices are firmly held. It is understood that agricultural implement interests last week bought upward of 5000 tons of Steel Bars for early delivery. There is no special movement in Iron Bars, though prices remain unchanged. Quotations are as follows: Iron Bars, 1.81½c. to 1.86½c.; Steel Bars, 1.76½c., both half extras; Hoops, 2.16½c., extras as per Hoop card; Bands, 1.76½c., as per Bar card, half extras; Soft Steel Angles and Shapes, 1.86½c., half extras. Store prices are as follows: Bar Iron, 2.10c. to 2.25c.; Steel Bars, 2c. to 2.10c.; Steel Bands, 2c., as per Bar card, half extras; Soft Steel Hoops, 2.35c. to 2.45c., full extras.

Boiler Tubes.—Owing to the lengthened deliveries from mills, prompt requirements are now largely supplied from warehouse stocks. In cases where mills are able to supply orders promptly, premiums over regular quotations are in some instances asked. With the principal producers out of the market, discounts quoted are nominal. Mill quotations on the base sizes are as follows: 2¼ to 5 in., in carload lots, Steel Tubes, 63.35; Iron, 50.35; Seamless, 49.35; 2½ in. and smaller, and lengths over 18 ft., and 2½ in. and larger, and lengths over 22 ft., 10 per cent. extra. Store prices are as follows:

	Steel.	Iron.	Seamless.
1 to 1½ in.....	35	35	35
1¾ to 2¼ in.....	50	35	35
2½ in.....	52½	35	35
2¾ to 5 in.....	60	47½	47½
6 in. and larger.....	50	35	..

Merchant Pipe.—Beyond an increasing scarcity in the smaller sizes in both Black and Galvanized Pipe, there is no change in the market. Quotations are based upon the offerings of local producers. Mill quotations on the base sizes are as follows: Black Steel Pipe, on base sizes, ¾ to 5 in., 72.35; Galvanized, 62.35, carload lots, Chicago. From store in small lots, Chicago jobbers quote 70 per cent. on Black Steel Pipe, ¾ to 6 in.

About 4 points advance above these prices is asked for Iron Pipe.

Merchant Steel.—New business of ordinary character is developing from day to day, and the volume of orders offered makes a satisfactory tonnage. Prices are unchanged and are as follows: Planished or Smooth Finished Tire Steel, 1.96½¢; Iron Finish, up to 1½ x ½ in., 1.91½¢; Iron Finish, 1½ x ½ in. and larger, 1.76½¢; base; Channels for solid rubber Tires, ¾ to 1 in., 2.26½¢, and 1½-in. and larger, 2.16½¢; Smooth Finished Machinery Steel, 2.16½¢; Flat Sleigh Shoe, 1.91½¢; Concave and Convex Sleigh Shoe, 2.06½¢; Cutter Shoe, 2.45¢; Toe Calk Steel, 2.31½¢; Railroad Spring, 1.96½¢; Crucible Tool Steel, 6½¢ to 8¢, and still higher prices are asked on special grades. Shafting, 50 per cent. off in car lots and 45 per cent. in less than car lots, base territory.

Cast Iron Pipe.—The United States Cast Iron Pipe & Foundry Company was the successful bidder in the letting of 12,000 tons last week by the city of Chicago. Under the terms of the letting the city may take the whole or any part of the total tonnage. It is possible that not more than 6000 tons will be taken, as the actual quantity to be purchased will depend upon the amount of the appropriation made for that purpose. A considerable number of small orders in lots ranging up to 500 tons are being booked, but no new inquiries for large amounts are reported. We quote per net ton as follows: Water Pipe, 4-in., \$38 to \$39; 6 to 12 in., \$37 to \$38; 16-in. and up, \$36 to \$37, with \$1 extra for Gas Pipe.

Coke.—While no special activity is shown, and the tone of the market is not one of unqualified strength, there is a fair demand from the foundries for prompt requirements, with 72-hr. Connellsville Coke, per car lot at ovens, for prompt shipment, quoted at \$3.60; Solvay Coke, \$6.75, Chicago, prompt delivery.

Old Material.—The outlook for a strong market in Scrap is not encouraging, though recent sales indicate a disposition on part of the mills to add to their stocks. A sale of 8000 tons of Old Steel Rails to a local mill is reported, and 6000 tons of Heavy Melting Steel was taken by the Grand Crossing Tack Company. Freer offerings are looked for from the country, now that open weather and good roads make deliveries practicable. When this movement begins more Cast Scrap, which is now unusually scarce, will be available. Two small lists, one of 900 tons from the Chicago & Northwestern, and the other (tonnage not stated) from the Erie, comprise the week's railroad offerings. A little better tone is noticed in Old Car Wheels, which are marked up 50¢. The following quotations are per gross ton, f.o.b. Chicago:

Old Iron Rails.....	\$25.00 to \$26.00
Old Steel Rails, 3 ft. and over.....	18.00 to 18.50
Old Steel Rails, less than 3 ft.....	18.00 to 18.50
Relaying Rails, standard sections, subject to inspection.....	31.00 to 32.00
Old Car Wheels.....	25.00 to 25.50
Heavy Melting Steel Scrap.....	16.00 to 16.50
Frogs, Switches and Guards.....	16.50 to 17.50
Mixed Steel.....	12.50 to 13.00

The following quotations are per net ton:

Iron Fish Plates.....	\$19.50 to \$20.50
Iron Car Axles.....	26.50 to 27.00
Steel Car Axles.....	21.00 to 21.50
No. 1 Railroad Wrought.....	15.00 to 15.50
No. 2 Railroad Wrought.....	14.25 to 14.75
Railway Springs.....	15.00 to 15.50
Locomotive Tires, smooth.....	17.00 to 17.50
No. 1 Dealers' Forge.....	12.00 to 12.50
Mixed Bushing.....	11.00 to 11.50
Iron Axle Turnings.....	11.50 to 12.00
Soft Steel Axle Turnings.....	11.50 to 12.00
Machine Shop Turnings.....	11.50 to 12.00
Cast Boring.....	9.25 to 9.75
Mixed Boring, &c.....	9.00 to 9.50
No. 1 Mill.....	10.00 to 10.50
No. 2 Mill.....	9.00 to 9.50
No. 1 Boring, cut to Sheets and Rings.....	11.50 to 12.00
No. 1 Cast Scrap.....	19.00 to 20.00
Stove Plate and Light Cast Scrap.....	15.00 to 15.50
Railroad Malleable.....	16.00 to 16.50
Agricultural Malleable.....	15.00 to 16.00

Cincinnati.

FIFTH AND MAIN STS., April 3, 1907.—(By Telegraph.)

Pig Iron.—While there have been no developments during the week tending to indicate any signs of weakness there has been but little inquiry in a general way, resulting in a very quiet condition of affairs. Prices, however, do not appear to have changed from what they were a week since, although there are one or two inquiries now pending that may be a potent factor in determining what the prices may be for the future. One of these comes from a concern in eastern Ohio and is for about 2000 tons of Northern Iron for delivery covering the last half, and one from a concern in the southern part of the State for about 3500 tons. It is quite probable that the contract will be let to-day for tonnage required by a central Ohio concern, mention of which was made in last week's report. After several attempts the advance of 25¢ per ton from Southern points

to the river became effective April 1. This will perhaps cause considerable friction, especially among consumers whose Iron has been delayed because of the inability to secure cars. It is suggested, however, that the furnaces may absorb this additional cost and thereby lessen the cost to their customers, although at this time it is uncertain what plan will be followed. During the past week considerably more Iron has been moved from Southern yards, and the situation in this respect is much more hopeful than it was several months since. Quite a number of local concerns are said to be figuring on their requirements for the last half, with light inquiry for early delivery. Freight rates from the Hanging Rock District to Cincinnati are \$1.15, and from Birmingham \$3.25. We quote, f.o.b. Cincinnati, as follows:

Southern Coke, No. 1.....	\$26.50 to \$27.00
Southern Coke, No. 2.....	26.00 to 26.50
Southern Coke, No. 3.....	25.50 to 26.00
Southern Coke, No. 4.....	25.00 to 25.50
Southern Coke, No. 1 Soft.....	26.50 to 27.00
Southern Coke, No. 2 Soft.....	26.00 to 26.50
Southern Coke, Gray Forge.....	23.00 to 23.50
Southern Coke, Mottled.....	22.00 to 22.50
Ohio Silvery, 8 per cent. Silicon.....	31.15 to 31.65
Lake Superior Coke, No. 1.....	26.65 to 27.15
Lake Superior Coke, No. 2.....	26.15 to 26.65
Lake Superior Coke, No. 3.....	25.65 to 26.15

Car Wheel Irons.

Standard Southern Car Wheel.....	\$29.00 to \$29.50
Lake Superior Car Wheel.....	27.50 to 28.00

Coke.—This market is rather quiet, ruling quotations being fairly well established. Shipments are said to be moving in a satisfactory manner generally. We quote the best brands of Connellsville and Virginia Foundry from \$3.75 to \$4, f.o.b. ovens.

Finished Iron and Steel.—Inquiries are said to be coming forward in a lively manner for all classes of material. Structural Steel deliveries are fairly satisfactory, with orders good. In many cases a premium of \$3 to \$5 per ton is being asked on Plates for any kind of prompt shipment. Most of the large mills are quoting shipments from 60 to 90 days on either Universal or Sheared. We quote, f.o.b. Cincinnati, as follows: Iron Bars, carload lots, 1.93¢, half extras, and in smaller lots, 2.10¢, full extras; Steel Bars, carload lots, 1.73¢, half extras, and in smaller lots, 1.95¢, full extras; Base Angles, carload lots, 1.83¢; Beams and Channels, carload lots, 1.83¢; Plates, ¼-in. and heavier, carload lots, 1.83¢, and in smaller lots, 2¢; Sheets, No. 16, carload lots, 2.15¢, and in smaller lots, 2.70¢; No. 14, carload lots, 2.05¢, and in smaller lots, 2.60¢; Steel Tire, 1 x ¼ in. or heavier, 1.93¢ in carload lots.

Old Material.—Prices appear to be holding fairly well, although the market is a little quieter. We quote dealers' prices, f.o.b. Cincinnati, as follows:

No. 1 R. R. Wrought, net ton.....	\$18.50 to \$19.00
Cast Boring, net ton.....	10.00 to 10.50
Steel Turnings, net ton.....	12.00 to 13.00
No. 1 Cast Scrap, net ton.....	18.00 to 18.50
Old Iron Axles, net ton.....	26.75 to 27.75
Old Iron Rails, gross ton.....	27.00 to 27.50
Old Steel Rails, long, gross ton.....	19.25 to 20.25
Relaying Rails, 56 lb. and up, gross ton.....	28.75 to 29.75
Old Car Wheels, gross ton.....	24.00 to 25.00
Low Phosphorus Scrap, gross ton.....	21.25 to 21.75

Birmingham.

BIRMINGHAM, ALA., March 31, 1907.

Pig Iron.—Sales the past few days have been less extensive than for the two or three preceding weeks, but producers state that the business booked during the month of March has been entirely satisfactory and far in excess of their anticipations. Buying the past week has been confined almost entirely to small melters and covers all the deliveries for the year. So far as can be learned, no changes have been made in prices, and the market to-day appears firm at about the following quotations: April shipment, \$22.50; May and June, \$21.50 to \$22; third quarter, \$18.50 to \$19; last quarter, \$18.50. It is pointed out by some of the sellers that the difference in price between Iron for immediate shipment and for third quarter delivery is too great, and that a decline in the one or an advance in the other may be expected in the near future. They are, however, inclined to the opinion that, owing to the small amount of Iron to be had for spot or second quarter shipment, and the large demand for such deliveries, it is not at all likely that it will be necessary to make any concessions. Much improvement is noted in the car situation, and the railroads are seemingly handling business a great deal better than for many months. The yards here, which have been blocked for lack of engines, are being rapidly cleared, and it is expected that within the next 30 days conditions will be something like normal again. The accumulation on furnace yards is also rapidly disappearing, and in a short time all the Iron due on last year's contracts will be in transit. It is stated that the furnace people were unsuccessful in securing a further postponement of the advance in freight rates and that it will become effective April 1.

Cast Iron Pipe.—Buying is confined to small lots for

extension purposes, but these are so numerous that a good tonnage is being sold. The market shows no signs of weakness, quotations on Water Pipe being about as follows per net ton: 4 to 6 in., \$35; 8 to 12 in., \$33; over 12 in., average \$31, with \$1 per ton extra for Gas Pipe.

Old Material.—The demand for Machinery Cast and Stove Plate continues good, but transactions on other grades have been limited. Dealers' stocks appear rather small and they are manifesting little desire to sell at concessions. While it is rather hard to fix a definite price on several grades, quotations are approximately as follows per gross ton, f.o.b. cars here:

Old Iron Rails.....	\$22.00 to \$22.50
Old Iron Axles.....	18.50 to 19.00
Old Steel Axles.....	16.50 to 17.00
No. 1 Railroad Wrought.....	19.00 to 19.50
No. 2 Railroad Wrought.....	13.50 to 14.00
No. 1 Country Wrought.....	13.50 to 14.00
No. 2 Country Wrought.....	12.00 to 12.50
Wrought Pipe and Flues.....	13.50 to 14.00
Railroad Malleable.....	13.00 to 13.50
No. 1 Steel.....	14.00 to 14.50
No. 1 Machinery Cast.....	16.00 to 16.50
Stove Plate and Light Cast.....	12.50 to 13.00
Cast Borings.....	8.50 to 9.00

Philadelphia.

PHILADELPHIA, PA., April 2, 1907.

As far as regards prices, the situation to-day is just about as it was a week ago, nor is there any probability that there will be much change for several weeks. Material for prompt delivery is so scarce that buyers are compelled to pay extreme rates, and as there are no stocks to fall back upon there is a constant demand for something that can be made available at the earliest moment possible. To accomplish this buyers have to do a great deal of shopping around, but are confronted on every side with firm quotations, and as regards deliveries during the next two or three months it is simply a question of take it or leave it at the price named. This applies in some measure to finished products also, although there is an undoubted slackening for deliveries during the last half of the year, but in the meanwhile this has no effect on prices. The prospect of larger supplies of Pig Iron is extremely small, and consumers recognize that if they want to get stock they must take it when the chance occurs, even though prices may be beyond what they think they ought to pay. The feeling in the trade, however, is that prices have reached their highest limit, but in consequence of the present scarcity and the improbability of any important increase in output it may be several months before prices are appreciably affected, and it is just possible that we may run the entire year without getting very far below the figures quoted in this report. It will require considerable time to create a surplus, and until that is accomplished it is natural to suppose that prices will be maintained, although for the last quarter of the year there is no doubt that producers would make low figures compared to those quoted for the quarter upon which we have just entered. The imports of Iron from England will probably not be so large during the next few weeks as they have been, although several cargoes are expected to arrive during April and May, which will tend to relieve the situation to some extent. Buying for the last half of the year is a trifle larger than it was a few weeks ago, although as a rule consumers are trying to get third quarter deliveries without going beyond that. Sellers, however, are anxious to make sales covering the entire six months, so that, unless a portion of the order is for the last quarter of the year, higher prices are insisted upon when the buyer is not inclined to exceed the three-month limit. Taking everything into account, the situation cannot be said to be distinctly less favorable than it was a week ago, although there is some lack of confidence, owing to the reports (some of which are founded on fact) that the railroads are curtailing their orders for equipment; but, as we have already said, there is full employment in all departments for the present, and in all probability it will continue until at least midsummer.

Pig Iron.—Considering the limited offerings, sales are on a somewhat large scale. Spot material is as scarce as it has been at any time for several months, so that prices command comparatively high figures. These vary to the extent of \$1 to \$1.50 per ton, according to circumstances, such as the location of furnaces and the cost of delivery to the consumer. Prices under such circumstances vary from \$25 to \$26 for carloads, or from that to 50 or 100 ton lots. To cover the three months of the second quarter, \$24.50 to \$25 would be a fair average price, depending upon quantity and the closeness of relations which exist between the buyer and seller. These are times in which a good deal of discrimination is used, the main point being to hold fast to regular customers and to make terms to them as easy as possible. Outsiders who may want to buy in considerable quantities are not regarded with so much favor, and have to pay a little more money. Buying for the third quarter is now of some

importance, and prices for that delivery are coming closer to those for the present quarter, while the last quarter of the year is comparatively neglected. Sellers, however, are inclined to give the preference to those who include a portion for the last quarter in connection with the order for the quarter preceding. If there is any change in sentiment at all, it is that prices are not likely to change to any great extent within the next six months. The situation is such that this may almost be regarded as a certainty. It will be impossible to meet the full requirements of consumers during the present quarter, and almost equally so to acquire any surplus during the quarter following, and until accumulation actually begins it is unlikely that producers will reduce prices until the necessity for doing so becomes apparent. The last quarter is a matter of more or less uncertainty; but, as a rule, producers are willing to do business at probably \$1 less than for the quarter preceding, but generally most of the sales include deliveries for both quarters. There seems to be no marked difference in the supply of any of the various grades, all being alike scarce for deliveries during the next three or four months. The following quotations are as near as can be given as a general range for the various grades and various dates for delivery in consumers' yards at points in eastern Pennsylvania or adjoining territory:

Second Quarter 1907.

No. 2 X Foundry.....	\$24.50 to \$25.00
Standard Gray Forge.....	23.00 to 23.50
Basic.....	24.25 to 25.00
Low Phosphorus.....	27.00 to 27.50
Middlesbrough, on dock.....	21.50 to 22.00

Third Quarter 1907.

No. 2 X Foundry.....	\$24.00 to \$24.25
Standard Gray Forge.....	22.50 to 22.75
Basic.....	24.00 to 24.50
Low Phosphorus.....	27.00 to 27.25

Fourth Quarter 1907.

No. 2 X Foundry.....	\$23.25 to \$23.75
Standard Gray Forge.....	22.00 to 22.25
Basic.....	23.50 to 23.75
Low Phosphorus.....	26.75 to 27.00

Ferro Alloys.—It is difficult to be exact in regard to prices in this line. Some reports are to the effect that considerably less than \$65 has been accepted for shipments to be made during the last half of the year. Competition for special business is said to have been the cause of the extremely low figure. There is not much demand to-day, but it is intimated that something like \$65 to \$66 could probably be done for the last half of the year. Spot lots, however, are scarce and command from \$70 to \$72, but these would be for immediate delivery. The feeling is unsettled and prices are somewhat inclined toward weakness.

Steel.—Business is a little quiet, although there is a fair demand for small lots, but large consumers are holding off, expecting to do somewhat better than quoted last week, present rates being \$31.50 to \$32.50 for Ordinary Steel Billets and \$37 to \$40 for Forging Steel.

Plates.—There is not much change in this department of the Steel trade. Specifications come in very promptly and mills are running as full as they can, subject to the disabilities of shortages of material, &c. New business is somewhat dilatory, but there is nothing that can be called reactionary, although for the time being there is less activity than there was two or three months ago. Prices are unchanged as follows:

	Carload. Cents.	Part carload. Cents.
Tank, Bridge and Boat Steel.....	2.13½	2.18½
Flange or Boiler Steel.....	2.23½	2.28½
Marine.....	2.53½	2.58½
Locomotive Firebox Steel.....	2.63½	2.68½

The above are base prices for ¼-in. and heavier. The following extra apply:

	Extra per 100 lb.
3-16-in. thick.....	\$0.10
Nos. 7 and 8, B. W. G.....	.15
No. 9, B. W. G.....	.25
Plates over 100 to 110 in.....	.05
Plates over 110 to 115 in.....	.10
Plates over 115 to 120 in.....	.15
Plates over 120 to 125 in.....	.25
Plates over 125 to 130 in.....	.50
Plates over 130 in.....	1.00

Structural Material.—There is quite a demand for small and medium sized lots, and in ordinary times the tonnage would be considered large, but with a great increase in capacity it is difficult to maintain a high degree of activity. Prices remain fairly steady, at about 1.83½c. to 2c. for Beams, Angles and Channels, although it is said that on desirable orders it is not difficult to get slight concessions.

Bars.—The demand is not active, yet there is enough doing to maintain the position on about the same level as for several months past. First-class Bar Iron commands 1.93½c., but on desirable specifications it is said that slight concessions have been made, and it is certain that this is done by mills not situated to meet the full requirements as regards sizes, &c. The scarcity of Steel enables sellers to get the same price as for Refined Iron, although for the deliveries during the summer months orders are entered at about a tenth less.

Sheets.—The demand is well maintained and there is no difficulty in running the mills to their full capacity, as the pressure for deliveries is urgent. Prices for mill shipments are unchanged, as follows, subject to the usual advance for small lots: Nos. 18 to 20, 2.80c.; Nos. 22 to 24, 2.90c.; Nos. 25 to 26, 3c.; No. 27, 3.10c., and No. 28, 3.20c.

Old Material.—The market is in a very peculiar position, but as a rule the feeling among holders is less confident than it was a week ago. The high price of Basic Pig prevents much decline in Steel Scrap, although some large lots of crops and other choice stock have been unloaded without much effect on the general market. Rolling mill stock and foundry Scrap are easier, and in some lines, such material as No. 1 Railroad, No. 1 Yard, Stove Plate, Borings, &c., prices are 25 to 50 cents lower than last week. Bids and offers for delivery in buyers' yards in this district are about as follows:

Steel Crops and Rails.....	\$19.00 to \$19.25
No. 1 Steel Scrap.....	18.75 to 19.00
Low Phosphorus.....	22.50 to 23.50
Old Steel Axles.....	22.00 to 22.50
Old Iron Axles.....	31.00 to 32.00
Old Iron Rails.....	27.00 to 27.50
Old Car Wheels.....	24.00 to 25.00
Choice No. 1 R. R. Wrought.....	20.50 to 21.00
No. 1 Yard Scrap.....	19.00 to 20.00
Long and Short.....	18.25 to 18.75
Machinery Scrap.....	22.00 to 22.50
Wrought Iron Pipe.....	17.00 to 17.50
No. 1 Forge Fire Scrap.....	16.50 to 17.00
No. 2 Light.....	11.75 to 12.00
Wrought Turnings.....	16.50 to 17.00
Axle Turnings.....	17.00 to 17.25
Stove Plate.....	17.50 to 18.00
Cast Borings.....	16.00 to 16.25
Grate Bars.....	15.75 to 16.25

G. F. Ehrenzeller announces that he has removed his offices from New York to the Pennsylvania Building, Fifteenth and Chestnut streets, Philadelphia, Pa., and will continue to represent Beer, Sondheimer & Co., of Frankfort-on-the-Main and London exclusively for all their interests in material of all descriptions with the Iron, Steel and kindred trades on the continent of North America.

Pittsburgh.

PARK BUILDING, April 3, 1907.—(By Telegraph.)

Pig Iron.—The Carnegie Steel Company has just accepted an option it had with the Bessemer Pig Iron Association for 10,000 tons of Standard Bessemer Iron for May delivery at \$22, Valley furnace. Sales of Bessemer and Basic Iron by the Bessemer Pig Iron Association, W. P. Snyder & Co. and other interests in March show a total of 68,500 tons, all of which was sold at \$22, Valley furnace, with the exception of about 4000 tons, part of which was sold at \$22.50, and the balance at \$23, Valley furnace, these small lots being for prompt shipment for which consumers paid a higher price than the regular market to secure prompt delivery. Small lots of Bessemer Iron for prompt shipment continue to bring \$22.50 to \$23, at furnace, and we note sales of 2000 tons at the latter price. A sale is reported of 9000 tons of Standard Bessemer for delivery over the last half of the year at \$21, Valley furnace. We quote Bessemer Iron for second quarter delivery at \$22, Valley furnace, while small lots for prompt shipment are held at \$23. We quote Northern No. 2 Foundry at \$24 to \$25 for spot shipment, at \$23 to \$24 for second quarter and \$22 to \$23 for second half of the year delivery. Most furnaces are willing to accept the lower prices named, but a few sellers are holding their Iron for the higher prices and are able to sell a moderate tonnage. We quote Northern Forge Iron, for which there is not much inquiry, at \$20.75, Valley furnace, or \$21.60, Pittsburgh. On a firm offer this price might be slightly shaded.

Steel.—The Steel market as regards supply is getting tighter and it is very hard for consumers to find any mills that have Steel to spare. Bessemer Billets for reasonably prompt delivery would probably bring upwards of \$30, Pittsburgh, while Open Hearth Billets are also very scarce and are being quoted at \$30.50, maker's mill, Pittsburgh or Youngstown.

(By Mail.)

It is intimated that cancellations of contracts for material by the railroads are larger than generally supposed, and this is adding to the uncertainty which exists as to the course of the Steel market after July 1. The situation up to that time is reasonably well assured, but should large consumers of Iron and Steel, like the railroads and others, persist in canceling contracts, such action is bound to be seriously felt. However, in the past week the more favorable news from Washington and the recovery of the stock market have had the effect of causing a more cheerful feeling, and unless some unfavorable developments should come it is confidently believed there will be a heavy volume of business in the last half of the year. In support of this it is pointed out that the Pig Iron output up to July 1 is well under contract, the Steel mills have enormous tonnage on

their books, Steel being scarcer at this time than for some months, while the finishing mills never had as large a tonnage sold ahead as they have at present. While it is true that much of this business can be canceled at the option of the buyer, yet it is believed nearly all of it will be taken out, unless we have more unfavorable developments. The market is in the condition that large consumers are studying the situation very carefully before placing contracts for future delivery, this being borne out by the fact that new tonnage entered in March was not as large as in February. There is a disposition all along the line to go slow, and in some cases contemplated purchases of Pig Iron, Scrap and other material have been postponed. The situation in Pig Iron is very strong, especially the entire output of the Valley furnaces in Bessemer Iron being under contract to July 1. The Bessemer Pig Iron Association has a small tonnage of Bessemer for May and June delivery, on which it is asking \$22 at furnace. There have been two or three sales of Bessemer for prompt shipments at \$23, these being of 1000 tons each, and also some tonnage sold for April delivery at \$22.50 at furnace. There is a fair demand for Foundry Iron, with prices steady, but Forge is rather quiet. The situation in Steel, as regards supply, seems to be getting worse, and both Open Hearth and Bessemer Billets for reasonably early delivery are practically impossible to get. It is said that very close to \$30, or all of that, has been offered for either Bessemer or Open Hearth Billets for last half of the year delivery. New tonnage in both Iron and Steel is holding up well, and in Pipe, Sheets, Tin Plate and Steel Bars is remarkably heavy. Most of the finishing mills have sufficient contracts to take their output to July 1 or longer, and specifications on these contracts are coming in at a very satisfactory rate. With the opening of good weather new enterprises will be started, which will mean an increasing demand for all kinds of Iron and Steel that enter into building construction. The situation as a whole is satisfactory.

Ferromanganese.—Heavy sales of Ferro have been made to Eastern consumers for last half of the year on the basis of \$67, Philadelphia or Baltimore, which is equal to \$68.92, Pittsburgh, and we quote this price on 80 per cent. Ferro for last half delivery. For prompt delivery from \$74 to \$75, Pittsburgh, is being quoted.

Muck Bar.—The demand is greater than the supply, and prices are firm. We quote best grades made from all Pig Iron at \$37 to \$37.50, Pittsburgh, while that made from part Scrap is \$33 to \$34, Pittsburgh.

Rods.—We note a continued scarcity in the supply for early delivery, the comparatively few concerns that roll Rods for the open market being filled up with tonnage for two or three months. We quote Bessemer Rods nominally at \$37, and Open Hearth at \$38, Pittsburgh, but for prompt delivery it is probable higher prices would have to be paid.

Skelp.—It is practically impossible to get Skelp for reasonably prompt delivery at any price. A large consumer is reported to be in the market for a round tonnage for early delivery, but has not yet succeeded in finding a source of supply, the mills being sold up for three or four months. Prices are very firm, and several consumers would probably agree to pay higher figures than are given in our quotations, if assured of deliveries. We quote: Grooved Steel Skelp, 1.90c. to 1.95c.; Sheared Steel Skelp, 2c. to 2.05c.; Grooved Iron Skelp, 2.15c.; Sheared Iron Skelp, 2.25c., all f.o.b. Pittsburgh.

Steel Rails.—Inquiries for Steam Rails are reported somewhat better, the Carnegie Steel Company having booked last week about 20,000 tons for forward delivery. The demand for Light Rails is not quite as active as it was, but the Carnegie Company has 42,000 tons on its books, this being about eight months' work for No. 3 mill at Edgar Thomson, on which Light Rails are rolled, and which is turning out about 5000 tons a month. We quote Light Rails as follows: \$33 to \$34 for 20 to 45 lb.; \$34 to \$35 for 16-lb., and \$35 to \$36 for 12-lb., at mill. Angle Splice Bars are held at 1.65c., and Standard Section Rails at \$28, at mill.

Structural Material.—A good deal of tonnage is being placed and inquiries are much better than for some time. The leading Structural mills are in better position now to figure on work, and as a result some low prices have recently been made on a number of contracts. The American Bridge Company has taken about 2000 tons for San Francisco and other work there is pending. The McClintic-Marshall Construction Company has taken about 1500 tons of bridge work for an Eastern railroad, and is figuring on a large amount of bridge work for Western roads. W. N. Kratzer & Co., of this city are making large additions to their plant which will considerably increase its capacity, and have recently taken contracts for office buildings and elevator work amounting to about 3000 tons. Deliveries on Steel Bars and Plates by the mills are still very unsatisfactory. Prices are firm and we quote: Beams and Channels, up to 15-in., 1.70c.; over 15-in. 1.80c.; Angles, 3 x 2 x ¼ in. thick up to 6 x 6 in., 1.70c.; 8 x 8 and 7 x 3½ in., 1.80c.; Zees, 3-in. and larger, 1.70c.; Tees, 3-in. and larger, 1.75c. Under the Steel Bar card, Angles, Channels and Tees under 3-in.

are 1.70c., base, for Bessemer and Open Hearth, subject to half extras on the Standard Steel Bar card.

Plates.—The demand for Plates continues extraordinarily heavy, and several local mills are unable to run to full capacity owing to shortage in supply of Steel. A local Plate mill is in the market for 5000 tons of Steel for early delivery, but has not yet been able to find a Steel company that is in position to meet the deliveries wanted. The demand for Plates from the Steel car works is unabated and is averaging from 2500 to 3000 tons per day. Some of the smaller Plate mills can make deliveries in three to four weeks, for which they are able to get premiums of \$1 to \$2 a ton. We quote: Tank Plate, $\frac{1}{4}$ -in. thick, $6\frac{1}{4}$ in. up to 100 in. wide, 1.70c. to 1.80c., base, at mills, Pittsburgh. Extras over this price are as follows:

	Extra per 100 lb.
Gauges lighter than $\frac{1}{4}$ -in. to and including 3-16-in.	
Plates on thin edges.....	\$0.10
Gauges Nos. 7 and 8.....	.15
Gauge No. 9.....	.25
Plates over 100 to 110 in.....	.05
Plates over 110 to 115 in.....	.10
Plates over 115 to 120 in.....	.15
Plates over 120 to 125 in.....	.25
Plates over 125 to 130 in.....	.50
Plates over 130 in.....	1.00
All sketches (excepting straight taper Plates varying not more than 4 in. in width at ends, narrowest end being not less than 30 in.).....	.10
Complete Circles.....	.20
Boiler and Flange Steel Plates.....	.10
"A. B. M. A." and ordinary Firebox Steel Plates.....	.20
Still Bottom Steel.....	.30
Marine Steel.....	.40
Shell Grade of Steel is abandoned.	

TERMS.—Net cash 30 days. For anticipated payments a maximum discount may be allowed at the rate of 6 per cent. per annum and for a longer time than 30 days interest shall be charged at the same rate per annum. Invoices paid within 10 days from date thereof, discount of $\frac{1}{2}$ of 1 per cent. is allowable. Pacific Coast base, 1.60c., f.o.b. Pittsburgh, with all rail tariff rate of freight to destination added, no reduction for rectangular shapes 14 in. wide down to 6 in. of Tank, Ship or Bridge quality.

Sheets.—As an indication of the activity in both Black and Galvanized Sheets, we can state that the American Sheet & Tin Plate Company is not promising deliveries on Galvanized Sheets inside of 24 weeks, on Blue Annealed 20 weeks and on Box Annealed Black Sheets 18 to 19 weeks. Tonnage obligations on the books of this concern, including Tin mill products, are 48 per cent. heavier than at this time last year. Other leading Sheet mills are almost as far back in deliveries, the entire capacity being well under contract for the next three months or longer. The supply of Sheet Bars seems to be getting scarcer, and at this writing three of the Sheet plants of the American Sheet & Tin Plate Company are idle for lack of Steel. Sheet Bars are now ranging from \$30 to \$31 in price, and to the mills that have to pay these prices for Bars and put them into Sheets there is not much profit. Prices are firm, and we quote: Blue Annealed Sheets, No. 10 gauge and heavier, 1.85c.; Nos. 11 and 12, 1.90c.; Nos. 13 and 14, 1.95c.; Nos. 15 and 16, 2.05c.; Box Annealed, Nos. 17 to 21, 2.35c.; Nos. 22 to 24, 2.40c.; Nos. 25 and 26, 2.45c.; No. 27, 2.50c.; No. 28, 2.60c.; No. 29, 2.75c.; No. 30, 2.85c. We quote Galvanized Sheets as follows: Nos. 10 and 11, 2.65c.; Nos. 12 and 14, 2.75c.; Nos. 15 and 16, 2.85c.; Nos. 17 to 21, 3c.; Nos. 22 and 24, 3.15c.; Nos. 25 and 26, 3.35c.; No. 27, 3.55c.; No. 28, 3.75c.; No. 29, 4c., and No. 30, 4.25c. We quote No. 28 Gauge Painted Roofing Sheets at \$1.85 per square, and Galvanized Roofing Sheets, No. 28 gauge, \$3.25 per square for 2-in. corrugations. These prices are for carload lots, jobbers charging the usual advances.

Hoops and Bands.—Practically no new tonnage is being placed, but specifications on contracts are coming in freely, and shipments by the mills are heavy. Prices are firm, and we quote: Steel Hoops, 2c., and Bands for all purposes at 1.60c., base, half extras, as per Standard Steel card. These prices are for carload lots, f.o.b. Pittsburgh, plus full tariff rail rate to point of delivery, an advance of \$2 a ton being charged for less than carloads.

Tin Plate.—The American Sheet & Tin Plate Company has officially announced \$3.90 per base box on Tin Plate for third quarter delivery, and is now entering tonnage of large jobbers and consumers at that price. This, however, does not prohibit the company from advancing its price at any time should conditions warrant. New demand for Tin Plate is heavy, and all leading mills are well sold up for second quarter, and have a good deal of tonnage on their books for third quarter delivery. Official prices for second and third quarter shipment are as follows: \$3.90 for 100-lb. Cokes, f.o.b. Pittsburgh, for 14 x 20 100-lb. Cokes, terms 30 days, less 2 per cent. off for cash in 10 days, on which price a rebate of 5c. a box is allowed for carload and larger lots.

Iron and Steel Bars.—There are no new developments in the report that the Implement makers would send a committee to Pittsburgh to request a concession in the price of Steel Bars for forward delivery on season contracts, and it is practically certain to be refused if made. The leading Steel Bar interests, these being Republic, Carnegie and Jones & Laughlin, have their product sold up for some

months ahead, while smaller interests that could make reasonably prompt deliveries are able to get from \$1 to \$2 a ton advance over the regular price, which is 1.60c., Pittsburgh. New tonnage in Iron Bars is heavy, some large contracts having recently been placed by car builders and other consumers. The mills are still behind in deliveries, especially on Steel Bars, and are not catching up to any extent. We quote Refined Iron Bars at 1.80c., Pittsburgh, and Steel Bars at 1.60c., base, half extras, f.o.b. Pittsburgh, these prices being for forward delivery.

Spelter.—The tone of the market is slightly easier and is about 5c. per 100 lb. lower. We quote prime grades of Western Spelter for spot shipment at 6.75c. to 6.80c., St. Louis, while for May and June 6.70c., St. Louis, or 6.82 $\frac{1}{2}$ c., Pittsburgh, is quoted. We note a sale of 100 tons for May delivery at 6.82 $\frac{1}{2}$ c., Pittsburgh.

Railroad Spikes.—The demand for standard sizes continues fairly active, but on the smaller sizes is very heavy, and makers are behind in deliveries. We quote standard sizes at \$2.30 to \$2.35 and the smaller sizes at \$2.50 to \$2.60 per 100 lb., f.o.b. Pittsburgh.

Merchant Steel.—The volume of new tonnage is fairly large, while specifications on contracts are coming in freely. The market is firm, prices being unchanged, and we quote: Smooth Finished Machinery Steel, 1.85c. to 2c., depending on quality; Flat Sleigh Shoe, 1.65c. to 1.75c.; Cutter Shoe, 2.15c. to 2.20c.; Toe Calk Steel, 2.10c. to 2.15c.; Railroad Spring Steel, 1.75c. to 1.80c.; Crucible Tool Steel, 6c. to 8c., for ordinary grades, and 10c. and upward for special grades. We quote Cold Rolled Shafting at 50 per cent. off in carloads, and 45 per cent. in less than carloads, delivered in base territory.

Pipes and Tubes.—There is an inquiry in the market for about 30 miles of 12 to 14 in. Riveted Steel Pipe for delivery at Reno, Nev., to be used presumably for irrigation purposes. The demand for Merchant Pipe continues enormously heavy, and the mills are simply snowed under with business. None of the leading Pipe mills is in position to take tonnage for delivery inside of 8 to 10 weeks or longer. The extreme discount on Merchant sizes of Iron Pipe is now about 68 per cent. on $\frac{1}{4}$ to 6 in., on which a half point and sometimes a point is allowed to the large trade. The extreme discount on Merchant sizes of Steel Pipe, $\frac{1}{4}$ to 6 in., is now about 74 and 5 per cent. to the large trade. Official discounts on Steel Pipe are as follows:

Merchant Pipe.

	Jobbers, carloads. Steel.
	Black. Galv.
$\frac{1}{8}$ to $\frac{1}{4}$ in.....	.65 49
$\frac{3}{8}$ in.....	.67 53
$\frac{1}{2}$ in.....	.69 57
$\frac{3}{4}$ to 6 in.....	.73 63
7 to 12 in.....	.68 53
Extra strong, plain ends:	
$\frac{1}{8}$ to $\frac{1}{4}$ in.....	.58 46
$\frac{1}{2}$ to 4 in.....	.65 53
$\frac{3}{4}$ to 8 in.....	.61 49
Double extra strong, plain ends:	
$\frac{1}{2}$ to 8 in.....	.54 43

Official discounts on Iron Pipe, which are shaded one-half point or more to the large trade, are as follows, f.o.b. Pittsburgh:

Standard Genuine Iron Pipe.

	Black. Galv.
$\frac{1}{8}$ to 6 in.....	.68 58
$\frac{1}{2}$ in.....	.63 51
$\frac{3}{8}$ in.....	.61 43
$\frac{1}{2}$ and $\frac{3}{4}$ in.....	.59 43
7 to 12 in.....	.63 48
Extra Heavy Iron Pipe, Plain Ends:	
$\frac{1}{8}$, $\frac{1}{4}$ and $\frac{3}{8}$ in.....	.63 41
$\frac{1}{2}$ to 4 in.....	.60 48
$\frac{3}{4}$ to 8 in.....	.56 43

Boiler Tubes.—The demand for both Locomotive and Merchant Tubes continues heavy, several very large contracts for Merchant Tubes having been placed this week and at high prices. Mills that are in position to make reasonably prompt deliveries are able to get from \$2 to \$3 a ton premium over official discounts, which are as follows:

Boiler Tubes.

	Iron. Steel.
1 to $1\frac{1}{2}$ in.....	.41 47
$1\frac{1}{2}$ to $2\frac{1}{4}$ in.....	.42 59
$2\frac{1}{4}$ in.....	.47 61
$2\frac{1}{2}$ to 5 in.....	.52 65
6 to 13 in.....	.42 59

Iron and Steel Scrap.—A fair amount of new buying is going on in the Scrap market, but the general demand is quiet. Consumers evidently believe that prices on Scrap may be lower, and are holding off as long as possible from making purchases. Dealers quote about as follows: Heavy Steel Scrap, \$18 to \$18.25, for Pittsburgh, Sharon or Steubenville delivery; No. 1 Wrought Iron Scrap, \$19.50; No. 2, \$18; Old Steel Rails, short pieces for Open Hearth purposes, \$18 to \$18.25; Old Steel Rails, rerollers, \$19.75 to \$20; Machine Shop Turnings, \$15.75 to \$16; Bundled Sheet Scrap, \$16.75 to \$17; Tin and Terne Plate Clippings, \$18.50 to \$19 in net tons. Low Phosphorus Melting Steel is \$22;

Cast Iron Borings, \$14.50; Old Car Wheels, \$24.50 to \$25; Steel Axles, \$22 to \$22.50; No. 1 Cast Scrap, \$21.50; Grate Bars, \$17; Stove Plate, \$16.50. All above prices are in gross tons, f.o.b. Pittsburgh, unless otherwise noted.

Coke.—Prices of both Furnace and Foundry Coke are easier, due to the fact that there is a full supply to meet all demands, and also because there is no trouble in getting cars as fast as needed. We quote Connellsville Furnace Coke for prompt shipment at \$2.75 to \$2.85 a ton at oven, and 72-hr. Foundry at \$3.50 to \$3.75 at oven.

The offices of Spang, Chalfant & Co., Incorporated, Etna Iron & Pipe Works, have been removed from the People's Bank Building to the twentieth floor of the new Union Bank Building, Fourth avenue and Wood street, Pittsburgh, having secured one of the finest suites of offices in Pittsburgh.

Hyde Brothers & Co., Pittsburgh, have removed their offices to suite 1610 Commonwealth Building.

The Pittsburgh offices of Henry R. Worthington, manufacturer of pumps and pumping machinery, have been removed from the House Building to rooms 610-612 Machesney Building.

Cleveland.

CLEVELAND, OHIO, April 2, 1907.

Iron Ore.—Ore shippers are making preparations to start cargoes down the lakes just as soon as it is thought safe for the vessels to try to get through the ice, and it is expected that the first cargoes of 1907 Ore will reach Lake Erie ports by April 20 if not a little earlier. Ore cars were sent from Escanaba to the mines on April 1 to be loaded, and several freighters that have wintered in Escanaba will soon have their cargoes aboard and be ready for making the first trip. Two boats, the first to start for Duluth this season, sailed from Lake Erie ports on April 2. Ore is being moved from the docks very rapidly. For a few days the car supply was short, but more cars are available now and the Ore is being taken to the furnaces as fast as it can be loaded. When the new Ore begins to arrive the docks will be pretty well cleared up. The supplies of some furnaces are running pretty short, and the furnacemen are anxious for an early opening of navigation, so that they can get first cargoes as soon as possible. The Ore market has been quiet the past week, although there has been some buying in small lots. Nominal quotations for 1907 deliveries at Lake Erie docks are as follows per gross ton: Old Range Bessemer, \$5; Mesaba Bessemer, \$4.75; Old Range Non-Bessemer, \$4.25; Mesaba Non-Bessemer, \$4; Siliceous Bessemer, \$2.75; Siliceous Non-Bessemer, \$2.50.

Pig Iron.—Northern Foundry Iron for spot delivery is scarcer than ever, and it is practically impossible to find any No. 2 or No. 3 for sale for immediate delivery. A few small lots have been picked up during the week at from \$25 to \$26, at furnace. The market remains firm, but there are scarcely any inquiries for Foundry Iron for second half delivery. Several furnaces in this district are virtually out of the market for the entire year, having sold up pretty closely to their expected output. The price remains unchanged at \$22, Valley furnace, for No. 2 Foundry for second half delivery. Some foundrymen are hard pressed for Pig Iron, and have been able to get along only by borrowing from foundries that were better situated, in order to supply their immediate needs. Foundrymen are complaining that they are unable to get Iron which they contracted for for first quarter delivery, and furnacemen put the blame on the railroads, claiming that they are unable to get enough cars. Some sales of No. 2 Foundry for May and June delivery have been made during the week at \$23 to \$24, Valley furnace. A few more sales of Middlesbrough Iron have been made at \$24.88, delivered. No British Iron is now offered for immediate delivery, all the available supply having been disposed of until the next cargo comes in, about April 20. Basic Iron is a little firmer, and furnaces are asking not less than \$21, at furnace, for second half delivery. There are no inquiries yet for the last half. Malleable Bessemer for prompt shipment is very scarce, and a few small sales are reported at \$23 to \$23.25. There is more activity in the Standard Bessemer Iron market, and some sales are reported at \$22, Valley furnace, for second quarter delivery. Southern Iron is firm at \$18.50, Birmingham, for No. 2, and there have been a larger number of sales than usual in this territory the past week. There are many complaints of poor deliveries of Southern Iron, because of the car shortage. The Cleveland Furnace Company blew out its stack for relining on March 30, expecting to have it in operation again about May 1. Quotations for the last half of 1907, f.o.b. Cleveland, are as follows:

Bessemer	\$21.50 to \$22.00
Northern Foundry, No. 1	22.50 to 23.00
Northern Foundry, No. 2	22.00 to 22.50
Northern Foundry, No. 3	21.50 to 22.00
Southern Foundry, No. 2	22.85
Gray Forge	21.00 to 21.50

Coke.—The market is quiet, and prices are lower.

There are very few inquiries either for prompt shipment Coke or for future delivery. Furnace Coke is selling at \$2.90 at oven. For Foundry Coke dealers are asking from \$3.65 to \$3.75 at oven.

Finished Iron and Steel.—There is absolutely no evidence of a lack of confidence in the future of the Iron and Steel market, in spite of the reported retrenchments by a number of railroads. The local market continues very optimistic and the heavy volume of business bears out the feeling. Not only have specifications come in freely the past week, but a large amount of new business has been booked. Instead of canceling orders, railroads are urging early delivery of materials already contracted for. A number of large manufacturing interests have come into the market for material for the second half delivery, and some of them are buying in larger quantities than usual. During the week a leading interest has booked orders for about 20,000 tons of Steel Bars for last half delivery at the established price of 1.60c., Pittsburgh. The purchasers were mostly large manufacturers. Another manufacturer was in the market with inquiries for 1000 tons of Steel Bars per month for a year, with the stipulation that he be allowed to begin to specify against the contract at once. After canvassing the market the consumer found that the best that he could do was to get the promise of the delivery of the quantity of Steel that he wanted beginning seven months from the date of contract, although one mill promised to make deliveries on a much smaller amount than the amount required, beginning in four months. The demand for Plates and Sheets, as well as for Steel Bars, continues very heavy. There is also a large demand for small Angles. Steel Bars are very scarce, and it is almost impossible to find any for sale for prompt shipment. Some mills that have been selling Steel Bars and other material for quick delivery at premium prices are now so loaded up that they are unable to take any more orders for the present, and mills are turning down offers every day to buy at premium prices. In deliveries none of the mills report an improvement and some are in a worse shape than a week ago. The Iron Bar situation remains easier, and one interest that has been holding the price firm at 1.80c., Pittsburgh, is now selling some sizes at 1.75c. Plates can still be secured in from two to four weeks by paying a premium of \$4 to \$6 a ton, but none of the mills taking future contracts promise deliveries within about four months. Sheet deliveries show no improvement, nothing being promised within about six months. Warehouse sales continue heavy, and jobbers are having trouble in keeping their stocks replenished. The warehouse price on Steel Bars is 1.95c. to 2c., and on Iron Bars, 2c. Jobbers' prices on Sheets are as follows: Blue Annealed, No. 10, 2.30c.; No. 28 One Pass Cold Rolled, 3.05c.; No. 28 Galvanized, 4.15c. The stock price on Boiler Tubes, 2½ to 5 in., is 64 per cent. discount.

Old Material.—There is a good demand for Cast Scrap, Borings, Turnings and Busheling Scrap, and the prices remain strong. Otherwise the market is quiet and there are but few inquiries. Dealers report a scarcity of all kinds of Old Material. Sales made by railroads during the week have been at good prices. The railroad offerings during the past few days included lists of about 2000 tons placed on the market by the Pennsylvania Railroad, about 2000 tons by the Big Four, and 1800 tons by the Cincinnati, Hamilton & Dayton. Heavy Melting Steel is a little weaker. The following are dealers' prices to the trade per gross ton, f.o.b. Cleveland:

Old Steel Rails	\$17.50 to \$18.00
Old Iron Rails	23.50 to 24.50
Steel Car Axles	21.50 to 22.50
Old Car Wheels	21.50 to 22.50
Relaying Rails, 50 lb. and over	29.00 to 31.00
Relaying Rails, under 50 lb.	31.00 to 32.50
Heavy Melting Steel	16.50 to 17.00
Railroad Malleable	17.50 to 18.50
Agricultural Malleable	15.50
Light Bundled Sheet Scrap	16.00 to 17.00
Bundled Tin Scrap	17.00 to 19.00

The following quotations are per net ton, f.o.b. Cleveland:

Old Car Axles	\$29.25 to \$29.75
Cast Borings	10.50 to 11.00
Iron and Steel Turnings and Drillings	13.00 to 13.50
No. 1 Busheling	14.50 to 15.00
No. 1 Railroad Wrought	17.50 to 18.00
No. 1 Cast	18.00 to 18.50
Stove Plate	14.50 to 15.00

The United States census makes the estimated population for 1906 of continental United States 83,941,510 and inclusive of Alaska and the insular possessions 93,182,240. The population of the State of New York is fixed at 8,226,990; Pennsylvania, 6,928,575; Illinois, 5,418,670; Ohio, 4,448,677. The population of New York City, which includes Brooklyn, Staten Island, Queens County and the Bronx, is 4,113,043. Chicago's population is 2,049,185, while that of Philadelphia is 1,441,735, St. Louis 649,320, Boston 602,278, Baltimore 553,669.

New York.

NEW YORK, April 3, 1907.

Pig Iron.—The market is decidedly quiet. There have been some moderate sized sales of Southern Iron at \$19, No. 2 Foundry, for May and June delivery, Birmingham, while some business has also been done at \$18.50 for June and July. In the New England market Standard No. 2 has been offered at \$24.25. There is not much demand, the largest single inquiry being for 1700 tons, prompt delivery. We quote for spot Northern Iron \$25.50 to \$26 for No. 1 Foundry, and \$24.25 to \$24.75 for No. 2 Foundry. For the second quarter we quote \$25 to \$25.50 for No. 1 Foundry, \$23.50 to \$24 for No. 2 Foundry and \$23 to \$23.50 for No. 2 Plain, at tidewater.

Steel Rails.—New business actually booked has been light in the past week, the principal contract being 5000 tons additional for the Norfolk & Western, taken by a Pennsylvania mill. In addition miscellaneous lots amounting to 3500 tons are reported. The mills are figuring on considerable foreign business, including a good tonnage for South America, and are much more willing to consider export orders than was the case last year, prices being now more attractive.

Structural Material.—The mills report that both new business and specifications are coming forward in satisfactory volume. Most of the leading consumers in this territory have placed orders that are expected to carry them through the year or well into the last quarter. Since the beginning of the year bridge and building work in the East have been rather quiet, and it has been a period of close prices. Some bidders, who for a long time have put in high figures on a good share of the work they have bid on, have been found coming close to the low mark on some recent jobs. In March the American Bridge Company booked 42,400 tons through its various offices, and it is estimated that the total awards through the country in that month were between 90,000 and 100,000 tons. On April 1 about 100,000 tons on which bids are in was still pending. The Pennsylvania Steel Company has taken the 4000-ton Columbia River bridge on the St. Paul extension to Seattle, this making a total of 21,000 tons of bridge work let for the new line. The American Bridge Company booked 3000 tons from the Erie for its main line bridge work this year. The Lehigh Valley awarded 700 tons of bridge work to the McClintic-Marshall Construction Company, and has received bids on 250 tons more. For the Pennsylvania Railroad about 800 tons of bridges were let last week. At Rochester, N. Y., a new hotel job, requiring 1300 tons, was taken by the Brown-Ketcham Iron Works, Indianapolis, Ind. Announcement is again made that the Friede Globe Tower Company has awarded the 4000 tons of Steel required for its Coney Island tower. About a year ago this contract was reported let to a Chicago firm of Iron and Steel merchants. A New York contract of the past week calling for 900 tons of Steel is for a wine house on West Seventeenth street, Levering & Garrigues being the successful bidders. We quote as heretofore on tidewater deliveries of Structural Steel, shipments from mill: Beams, Channels, Angles and Zees, 1.84½c.; Tees, 1.89½c.; Bulb Angles and Deck Beams, 1.90½c. On Beams 18 to 24 in. and Angles over 6 in. the extra is 0.10c. Sales are made out of stock of material cut to length at 2¼c. to 2½c.

Bars.—The market is quite well sustained on the basis of 1.84½c. to 1.89½c., tidewater, for either Best Refined Bar Iron or Steel Bars. Prices vary according to quantity and time of delivery. An occasional shading is made on Bar Iron, but usually by mills making a limited range of sizes and not in a position to take general orders.

Plates.—The local demand continues light. The range of quotations at tidewater is as follows, the inside figures being named by Western mills for delivery at rather a remote period in the future: Sheared Tank Plates, 1.84½c. to 2.04½c.; Flange Plates, 1.94½c. to 2.14½c.; Marine Plates, 2.24½c. to 2.34½c.; Firebox Plates, 2.75c. to 3.50c., according to specifications.

Cast Iron Pipe.—Possibly the Easter holidays, and perhaps the decline in stocks, may have caused the market to relapse into a more quiet condition the past week, but the inquiry recently has been rather light. Export inquiries are becoming a little more interesting, among them being one for 3000 tons from Cuba for deliveries next fall and winter, while others are in hand from Porto Rico and South America. Carload lots of 6-in. are held at \$35.50 to \$36 per net ton at tidewater.

Old Material.—The rather surprising feature of existing conditions is that parties who have recently been purchasers of Stove Plate, Heavy Cast Scrap, Heavy Melting Steel Scrap and Cast Borings have been urging more prompt deliveries. This would indicate that so far the business of consumers has not been affected by the great decline in securities on the Stock Exchange. Pipe Scrap has been in good demand and several sales of round lots are reported, although buyers are now making offers somewhat under prices they have recently paid. Busheling Scrap of all

kinds is moving fairly well but No. 1 Railroad Wrought and City Wrought are dull, with rather large accumulations in the hands of some of the dealers. Old Steel Rails in long lengths for rerolling, are neglected, practically none of the Eastern consumers having been in the market for them for some time, so that they can only find a sale to be cut up for melting. Quotations per gross ton, f.o.b. New York, are as follows:

Old Girder and T-Rails for Melting.....	\$16.00 to \$16.50
Heavy Melting Steel Scrap.....	16.00 to 16.50
Old Steel Rails, rerolling lengths.....	18.00 to 19.00
Relaying Rails.....	27.00 to 28.00
Old Iron Rails.....	23.50 to 24.00
Standard Hammered Iron Car Axles.....	28.50 to 29.00
Old Steel Car Axles.....	20.50 to 21.00
No. 1 Railroad Wrought.....	19.00 to 19.50
Iron Track Scrap.....	17.50 to 18.00
No. 1 Yard Wrought, long.....	17.50 to 18.00
No. 1 Yard Wrought, short.....	17.00 to 17.50
Wrought Pipe.....	14.50 to 15.00
Light Iron.....	11.00 to 11.50
Cast Borings.....	12.50 to 13.00
Wrought Turnings.....	14.50 to 15.00
Old Car Wheels.....	22.00 to 22.50
No. 1 Heavy Cast, broken up.....	19.00 to 20.00
Stove Plate.....	16.00 to 16.50
Grate Bars.....	14.00 to 14.50
Malleable Cast.....	19.50 to 20.00

Metal Market.

NEW YORK, April 3, 1907.

Pig Tin.—The statistics of the movements of Pig Tin which were issued April 1 were in some respects mixed, as the deliveries into consumption during March were large, amounting to 3900 tons; but the total deliveries for the first three months this year showed a decrease of 300 tons compared with the same time last year. The stocks in the United States showed a decrease, being 2748 tons, compared with 3740 tons at the end of the month previous. The total visible supply for Europe and the United States amounted to 13,130 tons, against 13,189 tons at the end of the previous month and 11,848 tons a year ago. The price of spot Tin is now 2c. a pound more than a year ago, but the statistical outlook favors lower prices than those prevailing a year ago, and the industrial outlook fore-shadows a falling off in business. Consequently an early decline to prices corresponding to those ruling a year ago would not be unexpected. Business during the week has been light not only on account of the declining market, but also in view of the prolonged London holidays. Sales were made on March 28 and 29, as well as April 1, at 40.45c. On April 2 the London market advanced slightly in view of favorable statistics and sales were made to 40.60c. to 40.65c.; later, however, concessions were made from these prices. Tin can be had in New York to-day at 40c. No great amount of activity is looked for in this trade until conditions become more settled, and the fact that London did not respond better to the fact that the deliveries into consumption during March were large has caused more fear of lower prices among the trade than, perhaps, any other factor. The London market is weak and active to-day, closing at £183 for spot and £181 for futures.

Copper.—The continued weakness of the London market and the fact that sales have been made in this country at concessions from ½c. to 1c. per pound below recent quotations clearly emphasize the fact that American consumers are for the time being at least unwilling to pay the high prices for Copper which have been ruling. Business is very dull and it is almost impossible to secure confirmation of actual business. Lake Copper may be quoted at 24.50c. to 25c., Electrolytic at 24c. to 24.75c., and actual business has been transacted within these limits. Casting Copper is especially weak and may be quoted at 23c. to 23.50c., although actual sales have been made near the inside figure. Apparently no one is willing to buy Copper unless he has actual and immediate use for it, as it is felt that to hold the metal is to lose. Rumors of a sale of a large amount of high grade Copper, although coming from a high source, are discredited, especially when the price named, 26c., was for July shipment. There is a much better outlook as far as supplies from the mines are concerned, and the production in the Butte District in March was at least 5000 tons in excess of that in February, although it must be recalled that mining operations for February were very unfavorable. The London market again declined heavily on very active trading to-day, closing at £91 15s. for spot and £93 10s. for futures, a decline of nearly £10 during the week and over £2 for the day. Sales have been made of European Copper shipped to this country. It is almost impossible to dispose of Scrap Copper at anything like recent quotations.

Pig Lead.—The Lead market is practically unchanged from last week, sales having been made for nearby delivery at 6.20c., although probably actual spot could not be obtained under 6.25c. There have been transactions in St. Louis at 6.05c., and it is confidently reported that on a firm offer 6c. would be accepted. On the other hand, it is known that the principal producer is still about two months behind

in the matter of deliveries. The London market is slightly easier, at £19 12s. 6d.

Spelter.—The market is dull and prices are practically unchanged, at 6.85c. to 6.90c., New York, and 6.65c., St. Louis.

Aluminum.—The scarcity of the metal continues, and prices vary according to the urgency of the customer's requirements. Sales of No. 1 Ingots have been made recently in the neighborhood of 38c. per pound, but this is no criterion for the general market as the transaction was large. Some additional producing capacity will be available before the end of the year, when it is hoped that supplies can be had more promptly.

Ferroalloys.—Ferromanganese continues to be held at about \$70, Atlantic seaboard, for future deliveries, but no business is reported at these prices. It is understood that the large amounts which were sold last month have broken the market and will cause the situation to remain unsettled for some time to come. Ferrosilicon is exceedingly scarce, practically none being obtainable for prompt shipments. Later deliveries can be had at \$110 to \$112.

Antimony.—Some very low prices have been made on outside brands of Antimony to arrive. There is little or no business, but Cookson's can be had at 24.50c. and Hallett's at 23c. It is more than probable that business could be done at ever lower figures.

Tin Plates.—Prices are unchanged from those of a week ago, at \$4.09, f.o.b. New York, and \$3.90, f.o.b. Pittsburgh. The leading interest has announced \$3.90, Pittsburgh, as its price for orders now being placed for third quarter delivery.

Old Metals.—Trade is almost at a standstill. Each transaction is the result of special bargaining and must stand on its own merits. The following range of prices represented dealer's selling prices on Tuesday:

	Cents.
Copper, Heavy Cut and Crucible.....	23.25 to 24.00
Copper, Heavy and Wire.....	22.75 to 23.50
Copper, Light and Bottoms.....	21.00 to 21.50
Brass, Heavy.....	16.50 to 17.00
Brass, Light.....	13.50 to 14.00
Heavy Machine Composition.....	20.50 to 21.00
Clean Brass Turnings.....	15.00 to 15.50
Composition Turnings.....	18.25 to 18.75
Lead, Heavy.....	5.90
Tea Lead.....	5.60
Zinc Scrap.....	4.90

Iron and Industrial Stocks.

NEW YORK, April 3, 1907.

Conditions in the stock market have shown some improvement, partly due to the covering of short sales and partly to greater confidence by investors. The action taken by the Treasury Department in keeping Government funds derived from custom house collections in circulation by their deposit in banks instead of being locked up in the Treasury has had the effect of relieving the tightness in the money market and reducing interest rates. The reports emanating from Washington relative to the attitude of the President toward railroad corporations have also been more encouraging to holders of securities. The tendency of prices has therefore been upward, although the level prevailing before the panic of March 14 has by no means been reached. The range of prices on active industrials from Thursday of last week to Tuesday of the present week has been as follows: United States Steel common 33½ to 37, preferred 95½ to 99½; Car & Foundry common 33¼ to 36½, preferred 96½ to 98; Locomotive common 58½ to 64, preferred 103 to 107; Steel Foundries preferred 35 to 36; Cambria Steel 36 to 38; Colorado Fuel 31½ to 35¼; Pressed Steel common 32½ to 36, preferred 90 to 92; Railway Spring common 42¼ to 45, preferred 90 to 92; Republic common 23¾ to 26½, preferred 78½ to 83; Sloss-Sheffield common 52 to 54½; Tennessee Coal 135 to 143; Cast Iron Pipe Common 33¼ to 36, preferred 74 to 81½. There was some recession to-day and last transactions up to 1.30 p.m. are reported at the following prices: United States Steel common 35¼, preferred 98¼; Car & Foundry common 36, preferred 97¼; Locomotive common 62½, preferred 105½; Steel Foundries common 8, preferred 37; Colorado Fuel 34½; Pressed Steel common 35¼, preferred 92¼; Railway Spring common 44; Republic common 25¾, preferred 82½; Sloss-Sheffield common 53; Tennessee Coal 143; Cast Iron Pipe common 35¾, preferred 77; Can common 5½, preferred 51¼.

Dividends.—The R. D. Nuttall Company, Pittsburgh, manufacturer of gears, has declared a dividend of 6 per cent., making a total of 20 per cent. for the past year. This company is an identified interest of the Westinghouse Electric & Mfg. Company.

The American Rolling Mill Company, Middletown, Ohio, has declared a quarterly dividend of 2½ per cent. on the common and 1½ per cent. on the preferred stock, both payable April 15.

The Vulcan Detinning Company has declared a quarterly

dividend of 1¼ per cent. on the preferred stock, payable April 20.

The National Fireproofing Company has declared a quarterly dividend of 1 per cent. on the preferred stock, payable April 15.

The Nova Scotia Steel & Coal Company has declared a quarterly dividend of 2 per cent. on its preferred stock and 1½ per cent. on its common stock, payable April 15.

The Standard Underground Cable Company, Pittsburgh, has declared a quarterly dividend of 3 per cent., payable April 10.

The American Sheet and Tin Plate Company.—The addition of eight hot mills to the Vandergrift Works of the American Sheet & Tin Plate Company, which will soon be ready for operation, and will make a total of 37 hot mills in that works, will give the galvanizing department full work. Shipments of black sheets from the Old Meadow and Scottdale works to Vandergrift for galvanizing will therefore be discontinued in the near future, as 10 galvanizing pots are now being added to the Scottdale Works, which will increase the output of that plant about 300 tons of galvanized sheets per day. When these pots are finished, the Scottdale Works will do all the galvanizing of its own sheets and also for the Old Meadow Works. A large new sheet mill is being added to the Canal Dover Works of the company, and this, with the eight new hot mills at Vandergrift, will give the company an increased output of about 40,000 net tons of sheets per year. The regular semi-annual gathering of the managers of sales was held at the company's general offices in the Frick Building, Pittsburgh, on April 2. Heretofore these gatherings have usually been in session two days, but this time the business was transacted in four hours, this being due to the sold-up condition of the American Sheet & Tin Plate Company on sheet and tin mill products, leaving much less business to be transacted.

Freight Advances on Finished Material.—Announcement has been made in the past week of advances in freight rates on manufactured iron and steel in territory west of Pittsburgh. It is reported that similar advances will shortly be announced in Eastern rates. The advances in Central and Western territory are approximately 10 per cent., being in some cases slightly more and in others somewhat less. From Pittsburgh to Chicago the advance is from 16½ cents per 100 lb. to 18 cents; from Pittsburgh to St. Louis, from 20½ cents to 22½ cents per 100 lb. The new rates go into effect on June 1.

The Duluth Steel Plant.—The United States Steel Corporation has authorized the building of a new plant of considerable size at Duluth, Minn., after a thorough investigation by a special committee. For the present the plant will consist of one blast furnace, six open hearth furnaces, a blooming mill, a combination rail and structural mill, a bar mill, docks, shops, a cement plant and by-product coke ovens.

The Abner Doble Company, San Francisco, Cal., has won the patent infringement suit brought against it by the Pelton Water Wheel Company. The Doble ellipsoidal water wheel bucket is held not to be an infringement of the Dodd bucket of the Pelton Company and the Doble centrifugal water guard is also held not to be an infringement of the Pelton Company's water guard, as used on its impulse wheels. The decision has just been handed down by the United States Circuit Court of Appeals for the Ninth Circuit.

The managers of sales of the various district offices of the Carnegie Steel Company are meeting at Pittsburgh this week.

No. 3 furnace of the Lackawanna Steel Company, Buffalo, N. Y., was blown out for relining on April 1. No. 1 furnace had previously been blown in after relining.

The structural mills of the Illinois Steel Company broke all records of production in March.

The Bethlehem Steel Corporation's Report.

The annual meeting of the stockholders of the Bethlehem Steel Corporation was held on Tuesday. The financial report of manufacturing operations in the year ending December 31, 1906, as had been expected, made an unfavorable showing. Manufacturing profits are given at \$1,859,353, a decrease of \$1,609,449. Estimated losses of \$647,193 reduced profits to \$1,212,160, and the balance, after interest, was brought down to \$762,749, a decrease of \$2,208,547. Further on in the statement extraordinary losses are placed at \$1,118,467, and the total profit and loss surplus of the corporation in consequence thereof was reduced to \$593,421, after the payment of dividends. The statement in its entirety shows to what a large extent the surplus has been drawn upon to meet losses.

Following is the profit and loss account of the corporation and its constituent companies, for the fiscal year ended December 31, 1906:

	1906.	1905.
Manufacturing profits.....	\$1,859,353	\$3,468,802
Estimated losses.....	647,193
Less manufacturing profit.....	\$1,212,160	\$3,468,802
Other income.....	152,015	153,673
Total income.....	\$1,364,175	\$3,622,475
Less interest on notes and advances....	44,122	12,875
Balance.....	\$1,320,053	\$3,609,600
Bond interest.....	557,303	548,530
Balance.....	\$762,749	\$3,061,070
Depreciation.....	400,000
Net increase year.....	\$762,749	\$2,661,070
Previous surplus.....	1,843,619
Total surplus.....	\$2,606,368	\$2,661,070
Extraordinary losses.....	1,118,467	295,671
Net surplus.....	\$1,487,901	\$2,365,399
Preferred dividends.....	894,480	521,780
P. and L. surplus.....	\$593,421	\$1,843,619

The general balance sheet as of December 31, 1906, compares as follows:

Assets.	1906.	1905.
Property account.....	\$37,857,260	\$32,001,263
First mortgage bonds received in part payment for property.....	518,847	557,196
Inventories.....	6,795,541	6,882,270
Notes and accounts receivable.....	2,513,186	2,821,533
Cash on hand and in bank.....	4,230,417	1,445,623
Deferred charges.....	943,324	150,294
Totals.....	\$52,858,578	\$43,858,181
Liabilities.		
Capital stock.....	\$29,770,000	\$29,770,000
Bonds of Bethlehem Steel Company..	16,159,000	8,759,000
Notes and accounts payable, &c.....	5,735,154	2,881,245
Bond interest accrued.....	103,145	123,645
Reserve for depreciation.....	400,000	400,000
Reserve for relining furnaces, &c.....	97,857	80,671
Surplus.....	593,421	1,843,619
Totals.....	\$52,858,578	\$43,858,181

Of the extraordinary losses \$500,973 was on uncompleted ship contracts taken since the formation of the corporation, \$439,092 was on Government cruisers contracted for by the United States Shipbuilding Company, and the remainder by earthquake and fire at San Francisco and Bethlehem.

A statement accompanying the annual report declared that the contracts on ships taken but not completed by the United States Shipbuilding Company were taken at a price which could only have resulted in the loss of about \$1,725,000. Losses on shipbuilding contracts taken since the purchase of the shipbuilding properties by the Steel Corporation are stated to be due largely to the unfavorable labor conditions existing at the Union Iron Works in San Francisco following the earthquake.

The total estimated value of the orders booked by the corporation during the year aggregated \$16,216,570, with an estimated value of unfilled orders on hand December 31, 1906, of \$13,300,885.

Speaking of the curtailment of Government orders and the efforts to divert the activities of the old plant into new channels, the report states that steps have been taken to develop a business in commercial products suitable to the facilities already existing at the plant. The new commercial plant, it is stated, will be in operation

in July of this year, instead of at the close of the year, as was originally estimated. The mills, however, will not reach their full earning capacity during the current year, though it is believed that they will add materially to the income for 1907.

The Foundation for the Promotion of Industrial Peace.

The Foundation for the Promotion of Industrial Peace, created by an act of Congress in order that an organization might be formed for the purpose of expending the money that came to President Roosevelt with the Nobel peace prize in the furtherance of industrial peace, elected its permanent officers at a meeting held in Washington, D. C., March 28, as follows: President, Chief Justice Fuller; treasurer, Seth Low; secretary, John Mitchell. The Board of Trustees named by the President some weeks ago is composed of Melville W. Fuller, Chief Justice of the United States; Oscar S. Straus, Secretary of Commerce and Labor; James Wilson, Secretary of Agriculture; Seth Low of New York; Marvin Hughitt, president of the Chicago & Northwestern Railroad Company; Thomas G. Bush of Birmingham, Ala., and John Mitchell of the United Mine Workers.

The trustees also elected a committee of nine, to be known as the Industrial Peace Committee. Archbishop Ireland of St. Paul and Marcus M. Marks and Ralph M. Easley of New York were named as the representatives of the general public; E. H. Gary, chairman of the Finance Committee of the United States Steel Corporation; Lucius Tuttle, president of the Boston & Maine Railroad Company, and J. G. Jordan of Columbus, Ga., were named as the representatives of employers, and Samuel Gompers, president of the American Federation of Labor; Daniel J. Keefe of the Longshoremen's Union, and Warren S. Stone, chief of the Brotherhood of Locomotive Engineers, as the representatives of labor. The terms of the committeemen range from one to three years.

New Blast Furnace at Hamilton, Ohio.—Edwin N. Ohl, president of the United Iron & Steel Company, Pittsburgh, which recently took over the Cherry Valley Iron Company interests, together with Geo. L. Pearson and some Cincinnati capitalists, has decided to build a new blast furnace at Hamilton, Ohio. The stack will be 18 x 80 ft., and will have a daily capacity of 275 to 300 tons of iron per day. The product will be foundry, basic or malleable Bessemer, and the output will be sold to local consumers, there being within a radius of 70 miles of Hamilton some very large foundries that are heavy consumers of iron. The furnace will have direct railroad connections with the Cincinnati, Hamilton & Dayton and the Pennsylvania Company's lines. It is expected to take from ten months to a year to build the furnace. Geo. L. Pearson, who for some years was manager of Atlantic Furnace of the Republic Iron & Steel Company at New Castle, Pa., will be superintendent. No contracts for equipment have yet been placed, but bids will be asked for all the work in a short time.

The Cargo Fleet Iron Company, Limited, Middlesbrough, England, recently made its first shipment of rails, 700 tons, Buenos Ayres being the destination. It applies on an order for 20,000 tons for the Buenos Ayres Pacific Railway Company. In addition the company has orders for 150,000 tons of rails for various railroads.

The total imports of spiegeleisen into the United States in the calendar year 1906 were 103,267 tons, against 65,457 tons in 1905, 4623 tons in 1904, and 122,016 tons in 1903. These figures do not include ferromanganese.

The Scully Steel & Iron Company, Chicago, has opened an office in room 919 Farmers' Bank Building, Pittsburgh, with Arthur M. Hirsch in charge.

N. V. F. Wilson has resigned his position with the Pressed Steel Car Company, Pittsburgh, to become general superintendent of the open hearth and crucible steel plants of the Colonial Steel Company, at Colonial, Pa.

OBITUARY.

CHARLES H. HAWKINS, who had long been prominent in the Western iron and steel trade, died at his residence in Chicago, on March 24. He was for many years the manager of the Chicago branch of the Brown-Bonnell Company, Youngstown, Ohio. After that company was merged into the Republic Iron & Steel Company Mr. Hawkins formed a connection with the new organization, which continued but for a short time, when he became identified with the Emlyn Iron Works, East Chicago, Ind. He was born in Waynesburg, Greene County, Pa., on March 15, 1834. Thirty years of his life were spent in Pittsburgh, where he thoroughly learned the iron and steel business. He is survived by his widow and daughter.

CHARLES B. WESTON, who was for many years actively engaged in the manufacture of iron, died March 27 at the home of his daughter in Newark, N. J., aged 77 years. He was one of the founders of the Oxford Iron & Nail Company, Oxford Furnace, N. J. He was a native of Massachusetts, and for a time lived at Scranton, Pa., whence he removed to Oxford Furnace. He retired from business in 1893. He is survived by three sons and four daughters.

JOSEPH ALLEN STARKEY, at one time a well-known blast furnace manager, died at Milwaukee, Wis., March 16, aged 83 years. He was born in England, coming to the United States in 1841, locating at Racine, Wis. In 1849 he took charge of the blast furnaces of the Brier Hill Iron & Coal Company at Youngstown, Ohio, where he remained until 1861, when he enlisted in the Union army, serving through the war. At the close he located at Wheatland, Pa., and operated a furnace there for a number of years. In 1872 he removed to Chicago to take charge of the blast furnaces of the North Chicago Rolling Mill Company, now a part of the Illinois Steel Company, and in 1879 removed to Milwaukee to become manager of the same company's furnaces at Bay View. He is survived by one son and two daughters.

EDWARD C. TURNER, Arlington, Mass., formerly treasurer of the George F. Blake Mfg. Company, manufacturer of steam pumps, Cambridge, Mass., died at Washington, D. C., March 27, aged 59 years. He was born in Scituate, Mass., the son of Job Turner, one of the founders of the Blake Company, and entered the business early in life and succeeded his father as treasurer, which office he filled until the business was consolidated into the International Steam Pump Company, when he retired. He leaves a widow, three sons and a daughter.

EDWIN ALONZO HILDRETH, well known as an inventor and as a manufacturer of woodworking machinery, died at Cambridge, Mass., March 26, aged 64 years. He was a native of Cambridge and graduated from the civil engineering course of Harvard College in 1864. He took up the profession of patent law, and held many patents of his own in woodworking and agricultural machinery. For years he was patent attorney for important manufacturing interests. He lived for many years in Harvard, Mass., where he manufactured woodworking machinery in partnership with his brother, Stanley B. Hildreth. He had served in the Massachusetts Legislature, and held important town offices. He leaves a widow, a son and two daughters.

JAMES CHARLES ROBERTSON, for many years connected with a large car works and foundry at St. Johns, N. S., died at Sharon, Mass., March 26. He was born in Bridgewater, N. S., in 1844. His business at St. Johns afterward became part of Rhodes-Curry & Co., Limited, Amherst, N. S., the well-known Canadian car builders, and Mr. Robertson was for some years managing director of the company. He retired several years ago. He leaves a widow and three children.

JOHN MCCARTHY, for eight years superintendent of the Emma Furnace of the American Steel & Wire Company, Cleveland, Ohio, died March 27, aged 46.

PERSONAL.

John F. Wallace was recently elected vice-president and chief engineer of the Holland-American Company, Rochester, N. Y.

Harry Coulby, Cleveland, president and general manager of the Pittsburgh Steamship Company, returns this week from a trip to England.

C. D. Gibson has resigned his connection with the Pratt & Whitney Company, 46 and 48 South Canal street, Chicago, to become superintendent of the B. F. Barnes Company, Rockford, Ill.

Harry Z. Bixler, chief engineer of the Republic Iron & Steel Company, Youngstown, Ohio, has accepted a similar position with the Inland Steel Company, Chicago.

W. C. McMahon, Detroit, Mich., has been elected president of the Belle City Malleable Company, Racine, Wis., to succeed T. W. Harvey, Jr., who has sold his interest in the company and resigned.

W. L. Hayes, until recently a member of the bond house of W. J. Hayes & Son, Cleveland, Ohio, has been appointed assistant manager of the American Steel & Wire Company for the Cleveland District. He will have jurisdiction under District Manager Robert W. Ney over the mills of the company in Cleveland, Niles and Sharon. Mr. Hayes was with the company for 22 years, but retired at the time the properties were absorbed by the United States Steel Corporation.

Labor Notes.

Owing to the fact that the American Shipbuilding Company introduced new workmen to take the place of strikers at Lorain, Ohio, all the men who remained at work when the strike was ordered, recently, left the plant on March 29, causing a practically complete cessation of operation.

Union molders on the Pacific Coast will ask this month for an 8-hr. day, in place of the 9-hr. day prevailing heretofore, and the national organization has been asked to support the men in making this issue. At one or two points in California and at several cities in Montana the 8-hr. day is now in force in the foundries, with a \$4.50 minimum for molders and \$4 for coremakers.

The polishers at the works of the Pope Mfg. Company, Westfield, Mass., are on strike, because of the refusal of the company to accede to demands of their union.

Spang, Chalfant & Co., Inc., Pittsburgh, have given their laborers an advance in wages of 15 cents a day.

At Pittsburgh the labor organization to be called Sons of Vulcan has been organized. This includes puddlers only, and it is said the organization comprises seven-tenths of the puddlers in western Pennsylvania.

The coal miners in the Pittsburgh District, who threatened to strike on April 1 in case steam pumps used at several of the coal mines were not removed, have agreed with the coal companies involved to arbitrate the question, and there will be no strike.

The regular annual convention of the Amalgamated Association to formulate wage scales for rolling mills, sheet and tin plate mills will be held this year at Toledo, Ohio, commencing May 7.

The entire capital stock of the Wason Mfg. Company, Springfield, Mass., was taken over April 1 by the J. G. Brill Company, Philadelphia, Pa., and the company has been reorganized with the following directors: James Rawle, Edward Brill and Samuel M. Curwen, representing the Brill Company, and Henry Pearson and Henry S. Hyde of the old board. Henry Pearson was elected president and general manager. George C. Fisk, who has been an officer of the company for 54 years and its president for 36 years, has retired.

It is reported that in a short time the Pennsylvania Railroad will place an order for 200 all-steel passenger cars, as recommended recently by James McCrea, president of the company.

The Machinery Trade.

NEW YORK, April 3, 1907.

The heavy demand for machinery continues, inquiries from large buyers, especially the railroads, being numerous. Several roads have plans completed for new shops or are building plants of considerable size, for which they are expected to come into the market shortly for equipment. Within the past few days the Mobile, Jackson & Kansas City Railroad issued a list covering about 20 machines, and the Delaware, Lackawanna & Western Railroad has issued specifications for some power equipment.

In the heavy power equipment line there are enough inquiries in the market to warrant the estimate of one prominent power man, to the effect that the trade will be busy during the usually dull summer months. There is a noticeable demand for equipment for electric railroad power houses, and it is said that the retrenchment on the part of steam railroads, as regards proposed extensions in the vicinity of New York, has resulted in increased ambition on the part of suburban electric railroad companies, which are making active preparations to extend their lines as rapidly as possible, in order to meet the needs of suburban travel. There is a good volume of business in engines and electrical equipment for small power plants, designed for use in office buildings and hotels, and there are indications that the trade in that line this year will be unusually heavy in this vicinity. The past winter was by no means a favorable one for construction work, and in consequence many building operations were delayed and purchases postponed. With the frost out of the ground there has been a resumption of building, and the inquiries indicate that builders of small engines and generators will have their resources taxed within the next few months.

Notices have been sent to the members of the American Supply & Machinery Manufacturers' Association advising them that identification badges are being prepared for members, for use at the joint convention of that association with the National Supply & Machinery Dealers' Association and the Southern Supply & Machinery Dealers' Association, to be held at Cincinnati, Ohio, from May 8 to 10, and the members have been asked to furnish the names of each delegate prior to April 20. The badges are to display in plain type the name of the wearer, and the name and address of the company represented. Each of the associations will have such badges, and blue ribbons will designate members of the American Association, while the National members and those belonging to the Southern Association will wear red. Tri-colored ribbons will be worn by the ladies who attend with the delegates. This plan of designating members has been found highly successful at other conventions, and has lent much to the social feature of the organizations. In the announcement sent out by F. D. Mitchell, secretary of the American Supply & Machinery Manufacturers' Association, it is stated that by direction of the executive committees of the three associations, manufacturers' exhibits will be discouraged at the convention.

Seaboard Air Line's New Shops.

Last week we referred to the new shops to be erected at Jacksonville, Fla., by the Seaboard Air Line. These buildings will cover considerable ground, and as some of them are to be quite large, particularly the machine and erecting shop, the company will have to buy a large amount of machine tool equipment. The largest of the group of buildings, exclusive of the roundhouse, will be the machine and erecting shop, which will be 117 x 380 ft. This building will be separated from the wheel rod and tender shop by a transfer table, and will have a 10-ton crane runway connecting it with the tin and smith shop. The other buildings that will require mechanical equipment include a wheel rod and tender shop, 66 x 200 ft., with an extension 60 x 66 ft.; tin and smith shop, 61 x 181 ft.; passenger car shop, 90 x 300 ft.; car wheel axle and smith shop, 28 x 150 ft.; boiler and engine room, 63 x 122 ft.; planing mill, 50 x 176 ft. There will also be a large roundhouse, with small machine shop attached. These are only the main buildings of the plant, the outlay including a number of smaller buildings such as usually make up a complete plant.

Work has been commenced on the portions of the \$2,000,000 shops to be erected by the Delaware, Lackawanna & Western Railroad at Scranton, Pa., this year. As noted in these columns before, the company has plans for an extensive plant at that point, which will be the largest repair and construction plant in the company's system, but it has been decided to erect only a portion this year, and lists are now being prepared covering the machinery equipment to be purchased and installed during 1907. The buildings now under way, and which will be completed by next winter, are the foundry, 120 x 400 ft.; blacksmith shop, 125 x 300 ft.;

storehouse and office, 65 x 325 ft., in addition to a large casting platform. The other shops included in the original plans, which it is stated are to be built later, consist of an erecting, machine, boiler and tank shop, 346 x 582 ft.; paint shop, 90 x 162 ft.; mine repair shop, 80 x 250 ft.; power house, 90 x 160 ft.; scrap platform, 40 x 400 ft.; laboratory, 40 x 70 ft.; roundhouse and other smaller structures. The equipment of the buildings now under way, it is understood, will necessitate the purchase of some power apparatus and will include a good sized list of cranes and conveying machinery, as well as foundry equipment. The company has set aside a site of about 25 acres, which will allow for additions subsequent to the completion of the present plans. Hydraulic elevators will be installed in all of the buildings, and electric drives will be used on all of the machines. From all accounts the trade has heard nothing much as to the actual requirements of the plant, but it is known that the company's engineers have been making some inquiries, with a view to arranging their schedule of required mechanical equipment. The new plant is designed for the repair and maintenance of locomotives for the Scranton, Utica, Oswego, Syracuse and Bangor and Portland divisions of the system, and it will be capable of taking care of 500 or more locomotives. Provision will also be made for some manufacturing. The road has specifications out for some power equipment, which, it is understood, is intended for use at Kingston, Pa., where the company is making some improvements. The requirements, it is said, include engines and boilers and some minor power equipment.

In the past few days the Pennsylvania Railroad has been sending out specifications for the large list of machinery which was noted in full in these columns last week.

Tennessee Coal, Iron & Railroad Company's Improvements.

The Tennessee Coal, Iron & Railroad Company, 111 Broadway, New York, is doing some purchasing just now in the way of rail mill equipment for its plant at Ensley, Ala. It was noted in these columns some time ago that the company had large improvements under way, and it is understood that most of the buying for the additions announced then has been done. Since the original appropriation for improvements, however, it has been found that the company's rail mill equipment at Ensley was not sufficient to take care of the output of the proposed additions to the facilities for producing steel. Consequently, the company has placed an order with the United Engineering & Foundry Company, Pittsburgh, Pa., for a new rail mill with a capacity of 2000 tons of steel rails a day. It is understood that the company will buy some power equipment to take care of the additions, and probably cranes and conveying equipment, as well as some coal handling machinery, will be added. Contract has been let to the Pittsburgh Steel Construction Company, Pittsburgh, Pa., for the erection of machine and blacksmith shops. The machine shop will be 50 x 104 ft., with a 30 ft. leanto on each side, extending the entire length of the building, and the blacksmith shop will be 60 x 120 ft., with a 20-ft. leanto. This latter shop will be equipped with three large steam hammers, and an electric crane for handling the heavy work will also be installed.

The Reading Iron Company, Reading, Pa., has awarded contract for the building of its new erecting shop at its Scott foundry department, and with the exception of a few electric traveling cranes very little new machinery will be required at present. This shop is being erected principally to make more room in the old machine shop, which is overcrowded.

The leading smelting and refining interest has been buying considerable machinery of late, especially in the power and conveying machinery line. It is understood that most of the equipment, of which purchases have been made and for which inquiries are out, is intended for the West, some of it going to a large smelting and refining plant to be erected in a suburb of San Francisco. This company is also purchasing much in the way of mining equipment, and is placing some orders for delivery as far ahead as a year from now. It may be added, in this connection, that the heavy mining operations in the cobalt and other regions where strikes have been made of late, have created a large demand for this class of equipment. Crane men who previously devoted their attention principally to shop equipment are now giving much attention to the mining business, and those in kindred lines, such as manufacturers of belt conveying machinery, hoisting engines, &c., are keeping their eyes on the mining industries. New mining engineering companies that have sprung up within the last year or so have developed as factors in the buying of machinery to an extent that is worth considering.

There are several inquiries in the trade for equipment for a steel castings plant, to be built at Spuyten Duyvil, N. Y., by Isaac A. Johnson & Co. The plant will be a one-story concrete structure, 60 x 120 ft., and it is expected that considerable will be needed in the way of foundry equipment. At present figures are being obtained on a 1000-hp. engine, with generators and boilers to correspond. The inquiries are being sent out by W. W. Taylor, 500 Fifth ave.

nue, who is the company's consulting engineer, and he will probably decide on the purchasing.

A company represented by William E. Webster, who has offices at Main and Jackson streets, Batavia, N. Y., is considering the advisability of erecting a cement plant on the Tom Bigbee River, in Alabama. Mr. Webster is making inquiries in the trade regarding equipment, with an idea of getting a general estimate on the cost of the plant.

Considerable equipment will be required by the Orange Electric Company, Monroe, N. Y., for a power house which the company intends to build, and inquiries are in the market for the power machinery, and they will be followed, it is expected, by inquiries for coal handling and conveying machinery, cranes and the like. The company is now asking for prices on three engines aggregating 2000 hp. and three generators of from 100 to 150 kw. each. The purchasing will probably be decided upon by R. K. Smith, who is president and general manager of the company, and can be addressed at Monroe, N. Y.

The contract for constructing the first part of the \$161,000,000 aqueduct to bring water from the Catskills has been awarded to the Thomas McNally Company, Pittsburgh, Pa., which agreed to do the work for \$4,126,000.

Chicago Machinery Market.

CHICAGO, ILL., April 2, 1907.

Persistent reports of railroad retrenchment and scarcity of money, together with the known unstableness of security values, are thought to be the causes chiefly responsible for a period of comparative dullness in machinery trade that became noticeable in the closing weeks of March. Perhaps caution, inspired by a feeling of uncertainty as to the effect of these influences and their ultimate results, has in some cases operated to delay the final closure of pending machinery contracts; but it is probable that only the larger undertakings involving extensive equipment have been thus affected to any considerable extent. It is, in any event, evident that manufacturers and dealers view the situation with more of complacency than apprehension, feeling that greater benefit than harm will accrue from a gradual slowing up of the pace that in many instances has crowded deliveries ahead into next year. Aside from the seeming unwisdom of extending delivery contracts so far into the future, manufacturers are beginning to realize that profit margins are necessarily shortened by the expense of high pressure methods in production, such as present conditions impose. Overcrowding of shop capacities and the irregular shifts required to expedite overdue contracts are not conducive to economy. If, therefore, the present unprecedented demand should recede to a more nearly normal level the industry will suffer no material loss. Within the past week, however, some reaction is apparent, and is especially noticed in an increase of inquiries and orders for machine tools. These come mainly from smaller interests, and though they include no complete equipments of notable size, the aggregate of single tool orders has made a satisfactory business. Very few of the dealers on Machinery Row are able to show on their floors anything worth while in the way of new tools, direct shipping instructions being furnished the factory for new machines as fast as they are turned out. Good second-hand tools of all kinds are in as great demand, and are equally as scarce as new ones.

Mobile, Jackson & Kansas City Railroad's Machinery Requirements.

Through its purchasing department the Mobile, Jackson & Kansas City Railroad Company, Mobile, Ala., is asking for offers on the following list of machinery: One 10-in. boiler makers' flanging clamp, one flue cleaning machine, one flue welder, one flue furnace, one hand test pump for boilers, 300 lb. pressure; one 42-in. double head boring mill, one 36-in. radial drill, one 60-in. radial drill, one 14-in. Fox lathe, with three-jaw universal chuck; one 18-in. quick change screw cutting lathe, with four-jaw universal chuck; one 16-in. pattern makers' lathe, one 16-in. plain screw cutting lathe, with four-jaw universal chuck; one 24-in. shaper, one 15-hp. vertical engine, one 25-hp. vertical boiler, submerged flue; one 4 x 10 in. outside molder, one small tenon machine for sash and doors, one small mortise machine for sash and doors, one automatic band saw flier, hand or power.

Among the enterprises that furnish evidence of the growth and extension of the iron and steel industry on the Western coast is that of the Invincible Rail Joint Company, 54-55 Ziegler Building, Spokane, Wash. This company has recently purchased a 2-acre site at Edmunds, a suburb of Seattle, where it will about April 1 begin the

construction of a plant for the manufacture of the J. B. Climo rail joint, the Owen-Shaw nut and bolt locks, and track bolts and nuts. An outlay of \$25,000 will be represented in the initial construction and equipment, but plans are under way for the erection of a rolling mill, which will be established to furnish material for the bolt plant. Catalogues, descriptive literature and information relative to rolling mill and bolt and nut machinery are desired.

The Witte Iron Works Company, Kansas City, Mo., builder of gas and gasoline engines, is preparing plans for the erection of a new plant at Sixteenth and Oakland streets, near the Missouri Pacific Railroad tracks, in the Blue Valley. The building will be of brick and steel construction, having a floor area of 60,000 sq. ft., and will be provided with up to date appliances, including fireproof furniture, shelving, benches, &c. Additional tools, such as cranes, hoists and necessary mechanical equipment, will be required.

Specifications for a new building that will double the present capacity of the Western Machine Tool Works, Holland, Mich., are now ready for bids from contractors. The company manufactures drilling machines, the greater part of which are sold in foreign markets, and it is now six to nine months behind its orders.

Kerney & Trecker, Milwaukee, Wis., manufacturers of milling machines, report the booking of a recent order from an Eastern manufacturing plant for 50 milling machines to be used in its works. This order is in addition to upward of 200 of these machines now in use in the same plant. In common with other manufacturers of machine tools, Kerney & Trecker have their full shop capacity booked ahead for several months to come.

Pawling & Harnischfeger, Milwaukee, Wis., have contracts in hand for machinery equipment that will occupy their full shop capacity for fully three months ahead. Among the company's recent orders is one from the Nordberg Mfg. Company, Milwaukee, Wis., for four electric cranes, ranging in capacity from 5 to 40 tons. These are to be installed in the new plant now being constructed by the Nordberg Company.

The Shultz Belting Company, St. Louis, Mo., has received from a firm in Texas an order for a leather belt of the largest size ever turned out by it. The belt in question is to be 24 in. wide, three ply, and 92 ft. long.

The Wichita Gas, Electric Light & Power Company, Wichita, Kan., recently purchased by stockholders of the United Gas Company, Wichita, Kan., is planning extensive improvements to the electric plant, which will include the purchase of new machinery, involving an outlay from \$75,000 to \$100,000. Franchises authorizing these improvements have been asked of the City Council, and plans for the installation of machinery are in course of preparation.

The L. S. Starrett Company, 15 South Canal street, Chicago, will on or before May 1 remove to 18-20 West Randolph street.

The offices of the Browning Engineering Company in Chicago have been removed, from the Monadnock Building to room 1006, Fisher Building, where the company has engaged a suite of rooms for its agency.

Philadelphia Machinery Market.

PHILADELPHIA, PA., April 2, 1907.

While a good volume of business was transacted during the month of March, on the whole, manufacturers and merchants have not yet been able to obtain the necessary data so that comparisons may be made with the total volume during the previous month. In a majority of cases, however, it is anticipated that it will be less than the aggregate business done during the month of February. Early in March orders were placed quite freely, but as the month advanced, and unsettled conditions prevailed in financial and other matters, the amount of new business placed fell off quite materially. Whether this falling off will be of a temporary character or not is difficult to foretell. At any rate, many prospective buyers who under ordinary conditions would have placed their orders before this are holding back, preferring to wait awhile and see what phase the market takes. It is contended by some that should cancellations be made of business already placed they would be able to get just as good deliveries a month hence as they would if they placed their orders to-day, and as the amount of new business has not been large chances of having to wait much longer for delivery at a later date should business be resumed on a very active scale would not be great.

Cancellations have been extremely light in this territory, and makers and sellers of tools have been able in almost every case to turn any tools canceled over to other purchasers without any difficulty whatever. Manufacturers have been so rushed with business during the past year or two that a

slight let-up in the pressure of orders is not entirely unwelcome. So many difficulties have arisen in connection with deliveries that business has been unsatisfactory in many ways, and not a few concerns have been virtually turning away orders for some little time.

During the week past the amount of new business offered has been fairly good. Inquiries keep up well, but are largely for single tools and for those of the medium and smaller sizes. Here and there some of the heavier tools are asked for, but the number is small. While inquiries are good, the amount of business placed has not been large. Buyers seem to be feeling the market, and but few actual orders have come out. Several good sized propositions have been before the trade for some weeks, but there is not much disposition shown to close these up promptly. Some railroad business has been offered, but this will under existing conditions no doubt be limited.

There appears to be a little more business for export. The demand, however, has been almost entirely confined to special tools, practically nothing having been done in what are generally termed standard tools. Many of the orders taken recently for special tools have been for those of heavy character, and manufacturers of such tools are pretty well satisfied with conditions in that branch of their business. Power equipment and transmission specialties have also had a good month's business, and such manufacturers as have been transacting a regular export business in those lines almost invariably report an increased volume of business.

The demand for boilers and engines does not seem to improve. Some satisfactory business has been done, but it has been rather spotty in character, and, while a good amount of business is under consideration, difficulty is experienced by the trade in booking actual orders. Second-hand boiler and engine dealers find trade in that branch of the business largely in the same condition, and while there is an apparent scarcity for some classes of boilers the demand is not nearly so active as the trade would like.

Dealers in second-hand machinery report a good volume of business. Inquiries are quite large, and prices are said to be high in comparison to new tools, but where spot delivery can be had the price does not seem to cut any particular figure.

The foundry trades continue active. The demand for castings of all classes is large, and foundries in many cases find it difficult to handle the business to the satisfaction of their customers. Delays continue to be experienced in obtaining supplies of raw materials, and some casting plants accept new business subject only to indefinite delivery.

Announcement has been made by the Department of Public Works of the award of contracts for the furnishing and installation of eight boilers, with stokers, feed pumps, &c., for the Lardner's Point pumping station. The major portion of the contract, including boilers, &c., was awarded to the Edgemoor Iron Company, Edgemoor, Del. The Green Fuel Economizer Company, Matteawan, N. Y., will supply the economizers.

The agreement between the city of Philadelphia and the Philadelphia & Reading Railroad for the building of the elevated railroad in connection with that company's surface tracks, mention of which was made in last week's issue, has been signed and work will be started at an early date and rushed to completion. The elevation of the tracks on Ninth street, it is said, will be started first, and work is to be begun at several points so as to facilitate the completion of the work.

The Department of Supplies, city of Philadelphia, is asking for bids, which will be received until April 8, for a number of supplies for the Bureau of Water. The specifications include, among other items, ferrules, rip saw benches and saws, and flanged stops. Specifications may be had from Director of Supplies, room 312, City Hall.

The R. S. Newbold & Son Company, Norristown, Pa., reports business in very satisfactory condition. In the last few weeks a number of orders have been taken for shears, punches and general heavy machinery, as well as for boilers. This company has recently closed a contract to erect an addition, 70 x 120 ft., to its boiler shop, which when completed will double the capacity of this department. Inquiries are to be noted for pipe cutting off shears and for boiler head flanging machines for export, and the outlook for both foreign and domestic business is considered very favorable.

The Hilles & Jones Company, Wilmington, Del., has completed purchases of the equipment for its new machine shop, mention of which has been previously made in these columns, and which is now nearing completion. This company continues to book quite a large volume of business, and notes but little diminution as compared with the previous month's business. A considerable quantity of tools has been ordered by the railroads, as well as by individual concerns. Shipments recently have been heavy, the company's recently added improvements enabling it to reduce materially the time required to fill orders. A recent shipment for export to Japan is to be noted. This comprised three heavy gate shears, 125 in. between housings.

Business with the Tindel-Morris Company, Eddystone, Pa., continues exceptionally good. Orders for both crank shaft lathes as well as cold saw cutting off machines have been numerous, and all departments of the plant are fully occupied. Considerable foreign business is reported through the company's representative, De Fries & Co., Duesseldorf, Germany, especially in Germany, Great Britain and France. Twelve Tindel Albrecht crank shaft finishing lathes have been placed with one foreign concern, while a number of others have duplicated orders. A very good foreign trade has also been done in Tindel inserted tooth saws and cold sawing machines.

The Newton Machine Tool Works, Incorporated, has a large volume of business on its books, and continues to receive a number of orders for cold saw cutting off machines, milling, rotary, planing and slotting machines, as well as for a variety of special tools. Considerable business has been done with steel foundries and locomotive companies, who in addition to putting in new cold sawing machinery are also replacing lighter machines with those of the heavier types. A good volume of business has been done for export, most of which is for special machine tools, for which during the past month several orders have been received from France, several from Japan and a few from Germany and England. Several notable orders have also been taken for large tools for floor plate work, one for a large four-spindle milling machine weighing upward of 100,000 lb., for locomotive work, and another for a special three-spindle milling machine for use in fabricating a new design of car coupler.

Cleveland Machinery Market.

CLEVELAND, OHIO, April 2, 1907.

The buying of machinery keeps up in a very satisfactory manner and local dealers continue to take an optimistic view of the situation, as far as the future is concerned. There has been no letup in buying the past week, a good amount of business having been done in the sales of one or two tools to a customer. The general condition of the market remains unchanged, the demand continuing good for all kinds of machine tools. Purchasers, as a rule, are anxious for quick shipment, but deliveries are not promised within from two months to a year. The automobile plants are still buying some tools for immediate needs, but have not yet entered the market with inquiries for their 1908 requirements. There are two inquiries in the local market for a large amount of shop equipment, one of them being for about \$20,000 worth of heavy tools and in addition quite a number of light tools. The company seeking this equipment has not yet completed its organization and further details are not available at present.

The only reports of a change in conditions come from some of the manufacturers of tools who sell directly to the railroads. Some of the manufacturers who usually do a large business with the railroads report that orders from Western roads have almost entirely dropped off. The general feeling, however, seems to be that the lull in buying railroad shop equipment will be only temporary.

The Balkwill Pattern Company has been incorporated with a capital stock of \$30,000. The company, which is now occupying leased quarters, will erect a factory building of its own in about two months, having already practically decided upon a site. The new plant will give the company more than double its present capacity. The building will be 68 x 120 ft. The company is in the market for a new gas engine, but outside of that will not buy much new equipment.

The Grant-Lees Machine Company, which recently began the manufacture of a new automatic gear cutter, has sold its first output of 10 machines and commenced the manufacture of another lot, which will be ready for delivery in July. The company has just placed orders for two more lathes, a grinder, miller and a screw machine, and will double the capacity of its plant within the next few months.

The P. A. Geier Company, manufacturer of high grade tools and machinery, has just commenced the erection of a new machine shop on St. Clair avenue, and when the new plant is completed, which will be in about 30 days, it will move from its present location on High street. The company's new shop will be 50 x 100 ft., which will provide much larger capacity than the present plant. The company has already placed orders for nearly all the new shop equipment that will be required, including a gas engine, lathes, planers, milling and screw machines and other tools.

The C. O. Bartlett & Snow Company has just received a large order for coal crushing and handling machinery from the North Shore Power, Railway & Navigation Company, for a new plant that is being erected near Montreal. This company has also recently received orders for similar equipment for the Garry Land Company, at Garry,

Ind., and for the plant of the American Steel & Wire Company, at Waukegon, Ill.

The Cleveland Pneumatic Tool Company is preparing a new catalogue, which will probably be issued in about 30 days. This company has recently installed a new broaching machine, and has booked an order with a German manufacturer for a gear cutter.

W. H. Welch, dealer in machinery and machine tools, with offices at 723 Williamson Building, has just been given the agency for the gas engines manufactured by the Struthers-Wells Company, Warren, Pa.

The Cleveland Castings Pattern Company has just completed one of the largest patterns ever made in the city. The pattern is for a 48-in. bed frame for a Corliss engine, and was made for the Nagle Engine & Boiler Works, Erie, Pa. The company, which was recently organized and purchased the Gobielle Pattern Works, reports a heavy demand for machinery patterns.

The Star Drilling Machine Company, Akron, Ohio, will begin the erection of a large addition to its plant in a short time, the present demand for the company's output necessitating an enlargement of capacity. The company has just increased its capital stock from \$200,000 to \$500,000 to provide for the addition.

Ground has been broken for the new plant of the Royal Motor Car Company and the engineers are now preparing the machinery lists, which will be out in a week or two.

The Dean Electric Company, Elyria, Ohio, is in the market for machine tool equipment for the large addition it is erecting.

The Canton Gear Company, recently formed at Canton, Ohio, has completed its organization by the election of the following officers: P. L. McLain, president; William Broom, vice-president; J. D. Figley, treasurer; C. E. Lewis, secretary and general manager. The officers and Andrew Hollinger and J. E. Sharp form the Board of Directors. The company is now looking for a site for a new plant.

The firm of Crowell & Peck, mining engineers and chemists, has been dissolved. Francis J. Peck has purchased the offices and laboratories at 731-735 Williamson Building and the company's testing and crushing plants and their equipment, retaining a number of employees of the former firm. The business of mining engineers, chemists, metallurgists and inspectors of building materials will be conducted under the firm name of Francis J. Peck & Co. at the old location.

Cincinnati Industrial Notes.

CINCINNATI, OHIO, April 2, 1907.

The Monitor Stove & Range Company, a new corporation, has absorbed the William Resor Company, which has been in existence since 1819. A deal has been closed for the purchase of a large tract of land fronting on the east side of Summers street, 233 ft., and extending to the west line of Berlin street a distance of 200 ft. This tract adjoins the present plant on the south, and is located just north of Gest street. Bids are now being received by Architect Hake for the new buildings, which will be absolutely fireproof and strictly modern. Contracts were let a week or so ago for a warehouse building, 50 x 188 ft., two stories high, of brick construction. The present plant consists of a foundry building, 160 x 250 ft., which when augmented by the several additions will more than double the output of the plant as it is to-day. The officers of the Monitor Stove & Range Company are: W. H. Schmidlapp, president; E. W. Hake, vice-president and general manager; I. B. Resor, secretary and treasurer, and J. W. Dupuy, superintendent.

The C. J. Andrus Furnace Company has leased from the Economy Mfg. & Supply Company the first, second and third floors and basement of the building at 308 Sycamore street. Mr. Andrus was formerly connected with the William Miller Range & Furnace Company of this city.

F. H. Lawson & Co. intend to rebuild at once the burned portions of their plant and also erect a new building upon the property now used for yard purposes.

The Ralston Steel Car Company, Columbus, Ohio, whose plant at East Columbus was recently damaged by a fire, which started in the blacksmith shop, states that the fire was mainly confined to the roof of that department, and has in nowise affected the productive capacity, the damage being of such character as to cause no delay whatever.

Julius Uhlein & Co., Cincinnati, Ohio, in addition to their present premises have just purchased the building and ground at the northeast corner of Elm and Burrows streets, formerly occupied by the Mosler Safe Company. The building will be remodeled and converted into an iron and steel warehouse at once.

The Reeves Gas Engine Company, Columbus, Ohio, recently incorporated with a capital stock of \$75,000, has secured 1½ acres of ground on the Toledo & Ohio Central Railroad, on which it will erect a plant for the manufacture of Reeves gas engines and for general repair work. A foundry for making gray iron castings will also be installed. The company will be in the market for considerable equipment for the plant, including one 5 and one 10 ton crane,

72-in. horizontal boring mill, 48-in. engine lathe, turret lathe and other machines. It is expected that the new shop will be ready for operation about September 1, when its line of vertical multiple cylinder gas engines, which it is now building up to and including 150 hp., will be increased. The incorporators are William A. Reeves, Edward R. Reeves, John F. Reeves, J. H. Hilberman and A. W. Shields.

New England Machinery Market.

WORCESTER, MASS., April 2, 1907.

The general impression in the machine tool trade and in kindred lines embracing a wide scope of equipment is that the market has steadied down to a constant demand, which is eminently satisfactory. Occasionally a dealer or manufacturer speaks of a letting up of inquiries, but usually the condition is followed closely by a resumption of the old volume of demand, both in orders received and in evidence of prospective business. No one has been able to find evidence that the recent trouble in the stock market has had any effect whatever on general trade, unless it be in the way of steadying things, which must mean a settling down to a long continued period of first-rate business, judging from the opinion expressed by every manufacturer with whom the matter has been discussed.

It is significant that several announcements of additional advances in prices of machine tools were received during the past week. The lines in question are rather special than standard, and while the increased prices means nothing as indicating other advances, yet they show that the trend of the market is not downward by any means.

Hill, Clarke & Co., Boston, booked a large order for Milwaukee milling machines during the week, the customer being one of the large electric companies. The order was about half what it would have been had the dealers been able to fill the entire requisition received from the purchaser. The order calls for delivery during the last months of the year, indicating that deliveries will hereafter be no better than the summer months of 1908.

There promises to be a serious strike of teamsters in Boston, which will be a source of much inconvenience in the trade. The dealers have been notified by the companies that look after their trucking that beginning to-morrow poor service is to be expected.

The Machinery Exchange, 10 Oliver street, Boston, is now well filled with tenants, a number of new companies having recently secured quarters there. They are the Abenague Machine Works, gas and gasoline engines, Westminster Station, Vt.; John Boyle & Co., mechanical rubber goods, New York; Burrows Mfg. Company, boiler feed water regulators, New York; Chattanooga Machinery Company, special sawing machinery, Chattanooga, Tenn.; Cordesman-Rechtin Company, woodworking machinery, Cincinnati; Gray National Telautograph Company, electrical transmission of writing, New York; Pennsylvania Iron Works Company, Globe marine engines, Philadelphia; Shepard Engineering Company, steam engines and boilers; Williams Gauge Company, boiler feed water regulators, Pittsburgh; Boston Emergency Company, emergency repairs on machinery, Boston, and Providence Belting Company, oak tanned leather belting, Providence, R. I. These additions bring the number of tenants up to 31, a remarkable increase considering that the exchange began business July 1, 1906, with eight tenants.

The Walter Baker Company, manufacturer of chocolate, 45 Broad street, Boston, is to erect a large machine shop at its works, Milton, Mass., the purpose being to secure adequate repair facilities. The building will be 50 x 125 ft., three stories. The company states that it will be in the market for machine tools later, but no list has been prepared as yet.

The Lumsden & Van Stone Company, 69 High street, Boston, contracting engineer, has prepared plans for a large foundry and machine shop, which has already had mention. The works will be located at Dorchester avenue and West First street, South Boston. The building will be 88 x 209 ft., one story. It is understood that negotiations for equipment have already been begun.

The Stilson Motor Company has been organized at Pittsfield, Mass., and will establish works for the manufacture of a six-cylinder gasoline automobile. Details of location and shop equipment are not decided. H. M. Stilson, 27 North street, is one of those interested in the enterprise.

The Old Colony Investment Trust, Board of Trade Building, Taunton, Mass., has purchased a tract of land in that city, 200 x 300 ft., upon which it proposes to erect suitable factory buildings for light manufacturing purposes, to suit tenants. Several jewelry manufacturing concerns have signified their desire to locate in Taunton, where there is plenty of suitable help now employed out of the city, and the purpose of the Trust is to provide quarters for these and other tenants. The trustees of the company are C. V.

Sanders, Edgar W. Sturgis, L. M. Witherell and S. F. Hammett.

The Bailey Automobile Company, Springfield, Mass., allusion to which has already been made, has awarded the contract for a shop building of concrete construction, 100 x 160 ft., two stories. The company states that the machinery has practically been purchased.

The C. A. Dreisbach Foundry & Machine Company, New Haven, Conn., recently incorporated in Connecticut, with \$10,000 of the authorized \$50,000 capital paid in, has secured an option on the pottery plant at Blatchley avenue and River street, and expects to begin business some time in May. The company will do a general foundry business, making a specialty of machine castings. The incorporators are Charles A. Dreisbach, for many years with the McLagon Foundry; George W. Hall, also of the McLagon Foundry, and Augustus L. Williams, who has had experience in foundry management.

The National India Rubber Company, Bristol, Conn., is to enter the field of insulated wire manufacturing on a large scale in a plant to be erected especially for the purpose. It is stated that it will be the largest works for the manufacture of rubber covered wire in the country, its daily production as planned being 3,000,000 ft. of wire. The new building will be of brick, 60 x 450 ft. and two stories. The heavy machinery, together with the insulating and testing apparatus and vulcanizer, will be located on the first floor, and the upper floor will be given over to the braidiers, for covering the wire with yarn. An existing building will be converted into a boiler room, and will be equipped with new boilers, heaters and tanks for covering wire. The electric plant of the entire works will be reorganized and enlarged. The National India Rubber Company has been manufacturing rubber covered wire for a number of years, but on a moderate scale.

The American & British Mfg. Company, Providence, R. I., will shortly issue its list of the machine tools for equipping its new buildings, work upon which has just begun. The contract for crane equipment has already been awarded to Pawling & Harnischfeger, Milwaukee. Most of the new machinery will be for heavy work, as the new buildings will be used for the building of heavy engines.

The Brown & Sharpe Mfg. Company, Providence, R. I., has adopted a 55-hr. week, as stated in the following notice which has been posted in the works: "Beginning May 1 the machine shops will run 55 hr. per week, closing at 12 m. on Saturdays. The matter of hourly wages will be arranged individually in a manner equitable to the men and the company." A similar notice has been posted at the works of the Builders' Iron Foundry, Providence, manufacturer of machine tools, pumps and other machinery, and castings.

The Cell Drier Machine Company has been organized to take over the business of the Vacuum Process Company, and will erect shops at Taunton, Mass., for the manufacture of machinery used in textile mills. The new company will operate under the management of Stone & Webster, 84 State street, Boston, where the headquarters will be located. Ten acres of land have been purchased on the line of the New York, New Haven & Hartford Railroad, and on tidewater. The machine shop will be 100 ft. square, and so arranged that it can be extended when need shall demand it, maintaining a width of 100 ft. The foundry plans call for the same scheme of extension, the first unit being 60 ft. in length and 100 ft. wide. There will be a cleaning house, 20 x 50 ft., and an office building, 32 x 32 ft. The company is not at present in the market for machine equipment, some machinery having already been purchased.

The only bid offered for the building of the Cape Cod Canal for the Boston, Cape Cod & New York Canal Company was that of the Cape Cod Construction Company, a new corporation organized for the purpose by a syndicate headed by August Belmont. The amount of the bid is \$11,990,000. It is expected that it will be accepted. August Belmont is president of the new corporation, John F. Buck, 23 Nassau street, New York, treasurer; Arthur L. Devens, Devens, Lyman & Co., Boston, and John B. McDonald, the well-known New York Subway contractor, are the vice-presidents. Mr. McDonald will have charge of the work, while William Barclay Parsons will be the chief engineer, which office he also holds in the canal company. The directors are Messrs. Belmont, Devens, McDonald and Parsons, and De Witt C. Flanagan, E. W. Lancaster and Dudley Pickman, all of New York. The contract calls for the payment in the bonds and stock of the canal company. The work will be a large one, calling for the use of a large amount of equipment of various sorts.

The Manufacturers' Foundry Company, Waterbury, Conn., manufacturer of cylinder castings, is adding largely to its works by the erection of new buildings, 85 x 170 ft. and 75 x 150 ft., respectively. The company states that all the equipment for the additions has been purchased.

The Bridgeport Malleable Iron Company, Bridgeport, Conn., manufacturer of malleable iron castings, is to erect a one and two story power plant, 35 x 112 ft. The company states that no further additions to its works are planned for this season.

The Naval Bureau of Ordnance has completed plans for

the new torpedo factory at Newport, R. I., and it is stated that proposals for the construction of the buildings and its equipment will be advertised shortly. It is said that the works will give employment to 200 workmen. The Ordnance Bureau has developed a new torpedo which will be manufactured at these shops.

Government Purchases.

WASHINGTON, D. C. April 2, 1907.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until May 7 for two duplex air compressors, one power brake and one portable oil fuel burner for the Mare Island Navy Yard.

Proposals will be received until April 23 at the Bureau of Supplies and Accounts, Navy Department, Washington, for one rotary blower, hydraulic jacks and other supplies for the Mare Island and Puget Sound navy yards.

The Bureau of Yards and Docks, Navy Department, Washington, will receive bids until April 20 for a locomotive jib crane for the League Island Navy Yard.

The following bids were opened March 26 for supplies for the Isthmian Canal Commission, Circular No. 355:

Bidder 6, The Becker-Brainard Milling Machine Company, Hyde Park, Mass.; 14, Drew Machinery Agency, Manchester, N. H.; 23, Fairbanks Company, New York; 24, Fox Bros. & Co., New York; 31, Landis Machine Company, Waynesboro, Pa.; 36, Manning, Maxwell & Moore, New York; 41, Niles-Bement-Pond Company, New York; 44, Pratt & Whitney Company, Hartford, Conn.; 45, Prentiss Tool & Supply Company, New York; 53, Stoeber Foundry & Mfg. Company, Myerstown, Pa.; 56, Vandyke-Churchill Company, New York; 57, Vermilye & Power, New York; 59, Excelsior Equipment Company, Pittsburgh, Pa., delivery at Pittsburgh; 65, Queen City Supply Company, Cincinnati, Ohio.

Class 1. One pipe threading and cutting machine—Bidder 14, \$1125, 130 days; 24, \$553.35, 21 days; 36, \$1079, 160 days; 53, \$950, 45 days; 56, \$585, 60 days; 57, \$1125, 120 days.

Class 2. One double headed bolt cutter—Bidder 23, \$1185 and \$1228, no time; 24, \$1166 and \$911.50, 40 days; 31, \$1150, 120 days; 36, \$923.61, 240 days; 45, \$1073, 90 days.

Class 3. One horizontal boring machine—Bidder 23, \$1217, no time; 24, \$1505.12, 120 days; 36, \$1690.50, 180 days; 45, \$1320, 91 days.

Class 4. One universal cutter and tool grinder—Bidder 6, \$690, 190 days; 23, \$343, no time; 24, \$289.74 and \$408.98, 135 days; 36, \$641.66, 90 days; 45, \$299, 120 days; 56, \$630, 90 days.

Class 5. One floor grinder—Bidder 23, \$59 and \$69, no time; 24, \$68 and \$89, 35 days; 36, \$56.50, 60 days; 45, \$64, 30 days.

Class 6. Two sliding head drill presses—Bidder 23, \$580, no time; 24, \$554.08, 130 days; 36, \$414.60, 150 days; 45, \$414, 90 days; 56, \$240, 60 days.

Class 7. One universal radial drill—Bidder 23, \$1362, no time; 36, \$1256.95, 180 days; 41, \$1385, 90 days, and \$1909, 35 days; 45, \$1528, 275 days.

Class 8. Two screw cutting engine lathes—Bidder 23, \$1228 and \$1498, no time; 24, \$1348, 225 days; 36, \$1307.56, 210 days; 41, \$1300, shipment 220 days; 45, \$1138, 180 days; 56, \$1300, 120 days.

Class 9. One screw cutting engine lathe—Bidder 23, \$1097, no time; 24, \$1034, 320 days; 36, \$1010.82, 210 days; 41, \$1348, shipment 170 days; \$1000, shipment 60 days; 45, \$927, 180 days; 56, \$1020, 60 days; 65, \$965, no time.

Class 10. One turret lathe—Bidder 24, \$1635.90, 139 days; 36, \$1165.33, 250 days; 44, \$1555, 150 days.

Class 11. One toolroom engine lathe—Bidder 23, \$445 and \$482, no time; 44, \$890, 150 days.

Class 13. One rotary splitting gear—Bidder 24, \$1954, 110 days; 36, \$917.34, 90 days.

Class 14. Four duplex lever punches—Bidder 24, \$133.74, 40 days; 36, \$156.41, 45 days.

Class 15. One double punch and shear machine and a quantity of punches, dies, &c.—Bidder 36, \$2457.15, 130 days; 41, item 15, \$2260 and \$2375, shipment 100 days; 59, \$2013.70, 180 days.

The following bids were opened March 26 for supplies for the navy yards:

Bidder 4, The American Woodworking Machinery Company, New York; 5, American Ship Windlass Company, Providence, R. I.; 7, Alliance Machine Company, Alliance, Ohio; 17, Brooklyn Forge & Supply Company, New York; 18, Berger-Carter Company, San Francisco, Cal.; 26, Case Mfg. Company, Columbus, Ohio; 27, Clayton Air Compressor Works, New York; 31, Chicago Pneumatic Tool Company, New York; 42, Dean Steam Pump Company, New York; 48, Economic Power & Pump Company, New York; 52, J. A. Fay & Egan Company, New York; 69, Hallidie Machinery Company, South Seattle, Wash.; 82, Independent Pneumatic Tool Company, Chicago, Ill.; 84, Ingersoll-Rand Company, New York; 89, Knox & Bro.

New York; 105, Montgomery & Co., New York; 107, Morgan Engineering Company, Alliance, Ohio; 108, Manning, Maxwell & Moore, New York; 116, National Electric Supply Company, Washington, D. C.; 120, Oliver Machinery Company, New York; 121, Pilling Air Engine Company, Detroit, Mich.; 125, Prentiss Tool & Supply Company, New York; 158, B. F. Sturtevant Company, Hyde Park, Mass.; 170, Wilmarth & Norman Company, Grand Rapids, Mich.; 171, Whiting Foundry Equipment Company, Harvey, Ill.; 175, Buffalo Forge Company, Buffalo, N. Y.; 178, Niles-Bement-Pond Company, New York.

Class 21. Four automatic motor hoists—Bidder 18, \$964; 84, \$1121.72; 121, \$1012.

Class 26. One steel pressure blower—Bidder 69, \$202; 158, \$335; 175, \$235.

Class 27. One steam winch—Bidder 5, \$1450.

Class 71. One single acting triplex electrically driven pump—Bidder 42, \$1253.50; 48, \$1247; 116, \$1045.

Class 81. One Clayton air compressor—Bidder 27, \$2861; 31, \$2260.

Class 91. One 36-in. band sawing machine—Bidder 4, \$150; 52, \$184; 120, \$284.

Class 101. One 25-ton electric traveling crane—Bidder 7, \$7235; 26, \$6545; 107, \$6490; 171, \$6100; 178, \$5545.

Class 126. One radial drill—Bidder 108, \$708; 125, \$754; 178, \$689.

Class 127. One keyseater—Bidder 125, \$634.

Class 128. One twist drill grinder—Bidder 105, \$110; 125, \$116; 170, \$99.75.

Class 131. One pipe cutting and threading machine—Bidder 108, \$260.

Class 132. One hand shear—Bidder 178, \$148.

Class 133. Two pipe benders—Bidder 17, \$554.50; 89, \$559.60.

The following awards have been made for supplies for the navy yards, bids for which were opened March 19:

The American Ship Windlass Company, Providence, R. I., class 11, one electric winch, \$1500.

William H. Wood, Media, Pa., class 41, one hydraulic portable riveter, \$790.

The H. A. Rogers Company, New York, class 42, one 500-ton reverse cylinder hydraulic press, \$2470.

The Bridgeman Bros. Company, Philadelphia, Pa., class 57, one sectional water boiler, \$142.75.

James B. Clow & Son, Chicago, Ill., class 60, one melting furnace, &c., \$155.37.

Under bids opened March 18, Circular No. 354, for supplies for the Isthmian Canal Commission, the Vandyck-Churchill Company, New York, has been awarded class 6, two cold saws, \$2774.

Catalogues Wanted.—Walter Gerhardt of Luedenscheid, Westphalia, Germany, desires catalogues in duplicate of firms who do sheet metal stamping, of manufacturers of dies and punches and of presses.

Owing to the heavy demand for vehicle forgings, the Union Forging Company, Union, N. Y., intends to build extensive additions to its works, which will include the erection of two buildings in which considerable new machinery will be installed. The company desires to receive catalogues of machinery and supplies such as are used in the manufacture of vehicle and drop forgings.

The Pittsburgh Foundrymen's Association.—The regular monthly meeting of the Pittsburgh Foundrymen's Association was held in the assembly rooms of the Engineers' Society of Western Pennsylvania, Fulton Building, Pittsburgh, on the evening of April 1. E. D. Frohman of the S. Obermayer Company, Pittsburgh, read a paper on "Fluxes and Alloys," which had been prepared by Alex. E. Outerbridge, Jr., of William Sellers & Co., Philadelphia. H. E. Field of Mackintosh, Hemphill & Co., Pittsburgh, talked of his personal experiences along this line. A discussion was also entered into by H. P. Spiker, C. H. Gale, H. E. Field and others. Secretary F. H. Zimmers read a circular from the American Foundrymen's Association regarding the foundrymen's convention, to be held in Philadelphia, May 21 to 24. The matter of arranging for the transportation of the Pittsburgh Association delegation is to be discussed at the next meeting.

The Southwestern Bridge Company is building a plant at Joplin, Mo., for the manufacture of structural steel, which, when completed, will cost \$300,000 and will contain 2000 tons of structural material. The plant will be located on 4 acres of ground on Illinois avenue, between Tenth and Twelfth streets, and is expected to be completed in about two years. J. K. Wingert is president, Tom Sawyer vice-president, E. J. Tutty secretary, C. Baker treasurer and H. W. Klare general manager.

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HARDWARE

MANUFACTURERS are still calling the attention of their customers to the terms on which goods are sold, and especially to the condition that in order to secure the cash discount payment must be made within the stipulated time. It is indeed to be regretted that it is necessary for them thus to insist on adherence to the terms of the contract, but even with merchants of high standing there is too much laxity in this regard. Instances are many of goods being purchased at a given price subject to a discount of, say, 2 per cent. for cash in 10 days, and remittance being made after 15 or 30 days or even more, the discount being coolly deducted and without a word of apology or explanation. This is a departure from the terms of the purchase which is not creditable to the merchant. The proper course for the manufacturer or other seller of the goods to pursue is to return the check, asking for a remittance of the whole amount of the invoice. This is being done in an increasing number of cases, but some manufacturers do not take hold of the matter in so vigorous and businesslike a manner and they accept the check, contenting themselves with requesting a remittance of the amount deducted, or in not a few instances sending a receipt for the account in full—a weak concession in the presence of a practice which should not thus be encouraged.

The American Hardware Manufacturers' Association is endeavoring to secure general adherence to the terms of payment, and in this good work should not only let merchants understand the obligation of making prompt settlement in accordance with the terms of the contract if they desire to avail themselves of the benefit of the cash discount, but at the same time they should impress upon manufacturers that it is their duty to themselves and to the trade at large to refuse to permit such deductions in cases where their customers are not entitled to them. If manufacturers are willing to accept the deductions when improperly made the merchants cannot be greatly blamed if they continue to make them and even interpret the terms of payment with increasing laxity, a course which affords the merchant temporary financial benefit, but at the expense of good business practice.

The movement toward reform in the matter of credits is well under way and may be observed even by a superficial student of retail methods. As is often the case the concerted recognition of the evil seems to go a long way toward its correction. The formation of local merchants' associations embracing all lines of trade, with the primary object of mutual credit protection, indicates the general trend of things and seems to be a move in the right direction. In the Hardware trade not a little has been heard regarding a strictly cash business, but while this has been attempted in isolated instances with some success it is not generally regarded as practicable under present conditions, especially where there exists a healthy competition. Some merchants have introduced a system of taking notes, with or without interest, for goods sold on credit. Others have instituted a plan of requiring settlement of all open accounts, either by cash or note, at regular intervals, say every two or three months.

The catalogue house which sells only for cash has probably in some ways been a friend in disguise, for by forcing the merchant to sell many lines at smaller profits it has made it imperative for him to scan his credits

more closely and insist more rigidly on getting his money when due. Easy going leniency is bad policy, not only because of the financial loss entailed, but because a merchant who is careless in his methods loses the respect of his customers and will have no sympathy in his misfortunes, even from those who have benefited by his foolish liberality. He also forfeits the confidence of the public, for they are intelligent enough to know that he must charge exorbitant profits to allow for losses suffered from bad debts. No honest man wants to make up for the deficiencies of the man who does not pay his bills, and those who are not entitled to credit when forced to pay cash will go to the merchant who by his strict and businesslike methods can afford to sell on a smaller margin.

Condition of Trade.

The progress of the season is reflected in the increased volume of business and the quantity of spring and summer goods which are passing into the stores of the retail merchants. The quickening influence of the coming of good weather is also felt in every department of trade, giving to the latter part of March an excellent record. This is primarily noticed in the trade of the jobbing houses, but the movement is prompt to reach the manufacturers, who are being called upon with liberal orders to replenish stocks. With the back orders which were on the books of manufacturers at the beginning of the season and the freedom with which purchases have been made, there are still many goods which are difficult to get, a condition of things to which the delays and troubles in connection with freights contribute. Prices with scarcely an exception are decidedly firm. Reports in regard to building show that in most of the principal cities of the East especially, and to some extent in the West, there are indications that building will be conducted on less liberal lines than last year, as the spirit of conservatism which is noticeable in several directions is having influence with capitalists and those interested in industrial enterprises. The harvesting of the crops is looked forward to with interest, as it is generally felt that if good crops are secured the outlook for fall business throughout the country will be excellent. There is a general recognition, too, of the fact that a moderate lessening of the pace and a perceptible though not heavy decline in the volume of business and in prices would have a healthful influence on the market and tend to secure the continuance of the existing prosperity. There is no special complaint in regard to collections, which are perhaps, taken all in all, a little better than they have been.

Chicago.

Trade in Hardware lines for the month of March is generally reported by jobbers to be considerably in excess of that of the corresponding month of last year. With no break in the phenomenal demand for goods, that has thus far made for each month of the present year new high record marks, it was fully expected that March would, at least, not fall short; but the increase shown is rather more than was anticipated. This is due in part to the unusually early opening of spring, which in Northern States is four weeks advanced. Dealers have been importuned, not only for prompt execution of current orders, but for anticipation of April deliveries by immediate shipment. Quite a volume of business was thus crowded into March that would in ordinary course have gone over into the next month. The demand for Nails has, if anything, increased, and jobbers complain that be-

tween tardy mill execution of orders and bad car service it is extremely difficult to maintain stocks in unbroken assortment. Garden and Field Tools are now wanted in all sections of the country, and Lawn Mowers are in active demand, the retail trade already being in full swing in Southern territories. It would indeed be difficult to name any particular class of goods that is not moving with at least reasonable activity. No tendency to slackness has developed in Heavy Hardware, and the pressure for wagon makers' and blacksmiths' stock, and Sheets and Bars, continues unabated. Bar Iron sizes are often completely exhausted by orders for unusual quantities received from manufacturers, who in emergency are compelled to resort to warehouse stocks. This is a class of trade that in ordinary times is not reckoned upon by jobbers when making up their specifications, and is of such a character that no adequate provision can be made to forestall its requirements. Price changes are becoming less frequent and no sagging is yet observed at any point. On the other hand, firmness rules in every department and prices are well maintained. There is on the whole nothing discouraging in the outlook for the Hardware trade, and barring extensive crop failures—a contingency little to be feared—there is at the present time every prospect for a highly satisfactory business throughout the year.

New Orleans.

WOODWARD, WIGHT & Co.—The sugar prospects for this year so far are the best that could be asked. The rains are commencing to-day, and if we have a few good ones the record will be all that the most patriotic planter could desire. Cotton seems to be doing all right, and so does rice. The lumber industry is still having considerable trouble over the car shortage, and a great many mills are shutting down with their yards full of lumber and every available corner around the buildings piled with it and no way of getting it out. If there were to be any sudden let-up in the car shortage it might cause a break in price, but the probability is the car shortage will get easier slowly and stocks will be worked off without any real decline.

The labor situation here is still very bad, and it is difficult to get men in almost any line. New Orleans has been put on a parity with New York in regard to emigration in the last few weeks, and it is probable the efforts of the Southern States and the Government's ruling as outlined a few days ago, will enable us to get from Europe direct to New Orleans, the necessary labor which has come to New York and which we have never been able to get down this way from there. There is a great deal of contracting work in this section now, and if the Panama Canal is let to contractors in small parts under the engineering corps, as it probably will be, there will be much better prices given for all work in this line.

President Roosevelt's appointment of a commission to consider the subject of waterways is going, ultimately, to have a far-reaching effect on all this Mississippi Valley section; and with the railroad rates being regulated by the Interstate Commerce Commission it should be possible for steamboat lines to operate and make a very decent profit on their investment in competition with the railroads when it is considered that the care of the roadbed is taken entirely off the hands of the water transportation companies, and that the only expense they have is the operation and keeping up of their boat and small terminals, as the waterways are kept up entirely by the Government. Hitherto a boat line starting up in this section has always had to meet a competition of cut rates from the railroad companies, and the territory the boat line could touch was of course strictly limited. In this restricted territory the railroad companies could put freight rates at below cost of transportation and cut the ground from under the feet of the boat transportation companies. If the policy is going to be to allow the railroads to combine on holding a certain definite rate, which rate will be approved by the Commerce Commission, and which will be binding on the railroad company for a certain fixed and definite time, and that a long time—if this ruling goes into effect the danger to water transportation companies of having special rates made to the points they

touch and rates with which they are unable to compete will be done away with, and it will simply be a question for them to consider as to whether there is a profit at a figure slightly under the railroad rate from point to point. If there is a profit it will be easy enough to get capital to go into it when they know the United States Government has practically guaranteed that the railroads cannot reduce that rate within five years or some period like that.

The trouble of the last two weeks in Wall Street does not seem to have extended at all into the business world, but it seems to have inspired a feeling of caution and desire to be conservative and thus avoid letting its disorganization get beyond the limits of the speculative world. This feeling in our section is pretty widespread, and is the best safeguard against depression that we could have. When the eyes of every one are open to the danger there is very little chance of the danger occurring. We have all had a warning; we have all got all the business we can attend to, and we hope and believe that it will stop there. Whatever may be the individual views of the Hardware merchant in regard to the largest corporation in the iron and steel industry, we think that all are agreed it has operated as a tremendous conservative factor, and that its tendency will be to soften very much the sharpness of a decline just as its tendency in times past have been to prevent any sudden and extreme raise in price.

Portland, Oregon.

FAILING, HAINES & McCALMAN.—In our last letter we mentioned the strike of the mill hands, which at that time was general in this city, and which we were afraid would affect business unfavorably. Notwithstanding the strike, which completely tied up the mills for about three weeks, we cannot see that it has had any bad effect on business, although if it had been long continued it might have had. We are glad to say the strike has been won by the mill owners, who are running their mills with full crews and expect to put on night crews shortly.

Car shortage and lack of locomotives continue with no immediate prospect of improvement. We hope, however, that some time in the near future we can get goods within less than three months after shipment, of which we have no surety to-day.

Building continues brisk in this city and in all neighboring cities and towns. The demand for Builders' Hardware and Mechanics' Tools, as a consequence, is exceptionally good. All other lines of business show a corresponding activity, and there seems to be no prospect of a let-up for at least a year. Crops promise well if the weather continues favorable for them.

We notice that many of your correspondents seem to be concerned about conditions of the stock market. We in this territory are probably more fortunate than dealers in almost any other in that the conditions in Wall Street and other stock exchanges do not affect us at all. Except for the head lines in the papers and such items, we would not know that there was such a thing as a stock exchange in existence. We all have enough troubles of our own out here trying to supply the unprecedented and still growing demands of our trade without worrying about panics in Wall Street.

St. Louis.

NORVELL-SHAIPLEIGH HARDWARE COMPANY.—We have been enjoying beautiful spring weather; the season is fully three weeks ahead of last year. All nature is responding to the call of spring, and trees and plants are putting forth their blossoms, buds and leaves. If we should have a heavy frost it would do great damage, especially to fruit.

Not only is nature responding to the call of spring, but the voice of the retail merchant is heard in the land calling for his spring shipments of seasonable goods. He calls for April 1 shipments, when jobbers are still struggling with March 1 specifications. Together with this, an exceedingly heavy current business is running. March will no doubt go down in history as the greatest month in the Hardware line that has ever been enjoyed by this city.

Some of the letters received not only from retail merchants, but from our own salesmen, indicate they do not seem to grasp the present situation. Salesmen write, for instance, "If you cannot get goods from one factory, why don't you buy from some other factory?" When it is a question of getting enough goods to take care of the business some retail merchants are still talking about that extra 1 per cent. in the price and "jump all over us" about shipments, just as if we controlled not only the manufacturers, the railroads, but the terminal situation here in our own city.

Nothing in business is more expensive than to sell goods and then not fill orders. It costs more money in handling business to leave out goods than to ship them: it means more work, and all this expense is lost. Some retail dealers do not seem to realize that jobbers are doing everything in their power to get goods.

The Nail and Wire people tell us their difficulty is to secure cars. They state they are shipping Poultry Netting in open coal cars and that Wire and Nails are being loaded in cattle cars. The Screen Door people tell us they have thousands of dozens of Screen Doors stacked up at their factory ready for shipment, but cannot get cars in which to load them.

I am told a story about a lumber dealer in the East who wrote the president of a Southern road that he would send him 100 cars if he would load these cars with lumber from his mill. The president of this road answered that even if these cars were supplied he could not use them for this merchant, as according to the Interstate Commerce law he would be compelled to pro rate these cars among all those in his territory who needed them; that it would be showing favoritism if he allowed this one man to use the 100 cars he himself was able to supply.

One of our salesmen in California writes that freight deliveries are slow out there because the jobbers in that section had fixed the railroads so they would discriminate against Eastern merchants. This made us smile. We wonder who have fixed our home railroads to discriminate against their home jobbers.

One cannot help but be impressed with the humorous side of some of these things. If, for instance, the railroad president who was so busy giving rebates a year or two ago had just held on to his rebates and used them in buying cars and locomotives and improving his track-age facilities, how much better off that road would be to-day.

I have heard of cases of merchants making special drives on certain lines of goods when they did not have the goods in stock. It is also amusing to see advertisements extolling the virtues of a certain Hardware article when, to save your living soul, you could not get these goods at any price from the jobbers and manufacturers advertising them.

These things simply show how rapidly conditions change in this country. When merchants lay out their plans for advertising and in other respects a year or two in advance they are likely to find their advertising going in one direction, while their business goes in another. It reminds me of the time I saw a sprinkling wagon attending strictly to its business in a pouring rain. I asked the driver why he did not hunt shelter and let the rain do the work for him, "Can't do it, sir," he replied, "I am working under a contract."

The most significant thing we have read for some time past has been Mr. Hill's letter to the Governor of Minnesota, in which he states in the past 10 years the increase in single track mileage has been 21 per cent., in locomotives 35 per cent., in passenger cars 23 per cent., in freight cars 45 per cent., while at the same time passenger mileage has increased 95 per cent. and freight ton mileage 118 per cent. We have no doubt these figures are correct, and it seems to us they tell their own story.

Of course we all know the trouble with railroad stocks just at present is lack of confidence, and the basis of lack of confidence is the question of the real value of these stocks after all water may be squeezed out. It does seem strange to a simple mind that some poor fellow is sent to the penitentiary because he obtains

money under false pretenses, while some rich fellow makes millions putting up a job to work off watered stocks on an unsuspecting public, and goes scot free. Surely we should have laws governing the issuing of stocks.

The writer knows of a case where the leading men in a certain business decided to unload their stock on the public. They decided they had got all out of the business that was in it. Everything was fixed up in apple pie order—public accountants certified to the truth of certain figures, but they did not certify to the truth of figures that were omitted. The public rushed in and bought the stock. The head men in this concern rubbed their hands and smiled. But the joke came a few years later when the business prospered; profits were so large that stock worth only a few cents on the dollar at the time it was exploited was soon paid up, and in this case it turned out that the special Providence which is said to care for drunken men and children protected the interests of these unsuspecting investors and all of them made money.

We wonder how many investors, without their own knowledge, have been saved in a like manner in the past few years by the great prosperity of the country.

All these things, however, go to point out clearly to all of us the fact that we should have laws covering the issuing of stocks of both railroads and industrial corporations which will protect the innocent investor. Therefore we believe all these things are making for good. Whatever the causes which led to his revelations, the country is under a debt of obligation to Thomas W. Lawson of Boston. He was the first to turn the calcium light, with inside knowledge, upon the methods of high finance; he was the first to write about these methods in such a way that the common people could understand how the strings are pulled.

Louisville.

BELKNAP HARDWARE & MFG. COMPANY.—Despite the perturbations in Wall Street and the dire threats of choking off business in order to bring "railroadphobia" to a head, business goes on with a grand tidal wave sweep. There is no such thing as stopping it when people have money and are engaged in taking in goods that they have seen advertised and longed for without being able to buy for years past. With cabbages selling at Corpus Christi at \$20 per ton spot cash out of the farm wagon, and with cotton over 10 cents at New Orleans, it is no wonder that the farmer has money to spend and to lend, if not to burn.

Indeed, there is no need for any additional fuel in the country as long as the thermometer insists on putting itself up to anywhere from 84 to 88 degrees every one of these March days, when it should be down at 40 or 50 degrees at the highest. A most unusually early season is on, fully four weeks ahead of time. The magnolias have been blooming exuberantly for a week or more; all the fruit trees are out in full array of blossoms, as though they were trying on their Easter robes ahead of the feast itself. Just what is in store for us we do not know, but it is safe to say that the very early vegetables and tender foliage are in great danger of a severe nipping in the near future. We cannot hold vegetation back. There is no way of standing off this revenge of nature, which seems bound to come. We can only wait and see and keep our overcoats handy.

Prices are firm, as they naturally would be with such a huge and pressing demand for goods, along with the demonstrated inability of the factories to supply the market fast enough. The telegraph companies and the long distance 'phones must be doing a land office business if the demands of the business world are any measure of their prosperity. "Why don't you fill our order given you last October?" is rather a familiar cry, even as late as March in the following spring, and for certain classes of orders placed now we cannot receive any more definite assurance than that they will be filled, say by June or July.

Any talk of the railroads reducing their facilities while this immense tonnage is being offered is out of the

question. It is something like an infant holding in its breath to bring his nurse to terms. It is bound to result in a red face and a lachrymose, repentant conclusion. What we want is not less facilities, but more facilities. The South needs particularly double tracks. It is simply impossible to operate the huge freight trains both ways at the same time with any degree of speed and safety. Head-on collisions are frequent occurrences, and the delays are more and more exasperating. The pressure put on the railroad companies with their confessed inability to meet it, is going to lead to the expansion of river transportation. We shall have more boats, more tows and barges, more slack water navigation in the Ohio and its tributaries. In the meanwhile, the country keeps on growing. We shall need both river and rail.

In the country the necessity of good wagon roads has never been lessened, but the development of trolley lines is affording some relief. With the opening up of the country and back woods we should have more widespread prevalence of law and order. There is enough force left, however, in the mob element to exert itself whenever restraint is in any wise removed or even weakened; hence, we have the dreadful, savage, bloodthirsty lynchings in various quarters, which might just as well be avoided if the officers sworn to maintain peace and order would do their duty and make a serious show of resistance.

Cleveland.

THE W. BINGHAM COMPANY.—Sunshine and copious, warm rains portend an early opening of spring, and we are receiving from our salesmen and by mail well assorted orders for goods to go forward at once. We are sorry that more of our customers could not have anticipated their wants further in advance, for, notwithstanding the large trade the Hardware jobbers have had since January 1, a steady demand and consumption of goods all over the land have depleted stocks on many lines of goods of our retail friends.

Now with the sudden opening of spring the demand will increase, and as usual all will want to be served at once. Happy is the jobber who has the goods to meet the call.

The high water along the Allegheny and Ohio rivers has interfered greatly with trade in that section, but we are all in hopes that the floods will soon recede and trade will resume its normal condition.

Nails and Wire, Screen Wire Cloth, Poultry Netting, Window Screens, Shovels, Spades, Gray, White and Blue Enamelled Ware, Plain and Retinned Ware, Carriage and Machine Bolts, Screws, Butts, Strap Hinges, Carpenters' Tools, Builders' Hardware, House Furnishing Goods, Garden Tools and Picks and Mattocks are in great demand.

Trade in mining, milling and manufacturers' supplies, such as Merchant Pipe, Cast, Malleable and Brass Fittings, Belting, Packing, Special Steel and Drills, &c., is very brisk just now. Many orders are now being placed for Ammunition and Axes for immediate and fall shipment.

Indications are we shall have an early opening of navigation and large quantities of goods will go forward by water to the West and Northwest. Jobbers' stocks are in better shape now than they have been for some time, and customers can order goods with the feeling that their wants will have prompt attention and orders will go forward as rapidly as possible, consistent with good service.

Nashville.

GRAY & DUDLEY HARDWARE COMPANY.—The three busiest months with the Southern Hardware jobber have come and gone, and those who were thoughtful enough to buy early when goods were cheaper, and when they could get them shipped, are entirely satisfied with the results so far in 1907. At this season of the year there is usually a perceptible falling off in the orders for spring Hardware, but so far this has not been noticed.

Notwithstanding the unsatisfactory conditions prevailing in the stock market the demand for goods is strong, in fact the average merchant or manufacturer in this section is too busy attending to his own business to give much thought to what is taking place on Wall Street.

Collections are good, and conditions generally quite satisfactory.

Philadelphia.

SUPPLEE HARDWARE COMPANY.—It is hard for the average man to be unaffected by the weather, and as business is made up of the collective wants of the multitude of average citizens, its activity or depression reflects very clearly the weather conditions in various sections. This has been particularly noticeable during the last two weeks in regard to orders for Garden Tools and all spring and summer Hardware, especially from that class of merchants who wait until the last minute before ordering. While the procrastinating buyer is yearly growing less numerous, there are still enough of them to make the aggregate demand on jobbing stocks very noticeable whenever the thermometer reaches into the eighties a month or so before there is any precedent for having done so. This morning, as we write, we are rejoicing in a drop of 56 degrees from the maximum of last week. A cold spell now will reduce the anxiety and urgent demand for immediate shipment of some lines that have been exhausted by the abnormally early demand of the last few days, giving opportunity for restocking.

Trade continues in fair volume and thus far seems to be unaffected by the acute variations of the Wall Street barometer. The idea that Wall Street reflects the actual conditions of the commercial world has received another backset, and it is becoming more and more evident that the country does not take its gymnastics as any indication of the real condition of the solid commercial and financial interests of the country at large.

NOTES ON PRICES.

Wire Nails.—The possibility of mills catching up with deliveries appears to be more remote, owing to the steady increase in business and shortage in the supply of cars and of steel. Under these conditions jobbers find it difficult to keep assorted stocks from which to supply customers. Early deliveries secure premiums in some cases. The market is strong at unchanged prices. Quotations are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers.....	\$2.00
Carload lots, to retail merchants.....	2.05

New York.—Local demand is comparatively moderate and not up to the same period last year. Some delayed shipments of Nails bought at lower than ruling prices, are now being received. Prices are fairly maintained, notwithstanding present conditions. New York quotations are: To retailers, carloads, on dock, \$2.19; less than carloads, on dock, \$2.33; small lots at store, \$2.30.

Chicago.—Demand continues without abatement and jobbers are experiencing more or less difficulty in keeping up their assortment of sizes. Prices are firm and deliveries slow. Prices remain unchanged, and quotations are as follows: \$2.15 in car lots to jobbers and \$2.20 in car lots to retailers, with an advance of 5 cents for less than car lots from mills.

Pittsburgh.—We note a steady increase in demand for Wire Nails, the mills being pushed to their utmost to get out product and are not able to satisfy customers on deliveries. The continued shortage in supply of steel, which seems to be getting worse, together with the scarcity of cars, are operating against output and shipments, and the outlook is that the mills will get further behind on deliveries instead of catching up. It is stated that slight premiums are being secured over the official prices for early deliveries. Prices are unchanged, but the market is very strong. Quotations are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers.....	\$2.00
Carload lots, to retail merchants.....	2.05

Cut Nails.—Some improvement is noticed in deliveries, although demand is still in excess of the output of the mills. Stocks at mill and in the hands of jobbers

are reported light, especially on the sizes for which there is the largest demand. It is understood that some of the Western mills are asking slight advances over the general prices. Quotations are as follows, f.o.b. Pittsburgh: Carload lots, to jobbers, \$2.05; less than carloads, to jobbers, \$2.10; less than carloads, to retailers, \$2.20. Iron Cut Nails at points west of Buffalo and Pittsburgh are held at 10 cents advance on Steel Cut Nails.

New York.—Business in Cut Nails is somewhat light, but a better assortment is available in the local market, owing to receipt of delayed shipments. Some of these Nails were contracted for at lower than prices now ruling. Prices are fairly well maintained under these conditions. Jobbers' quotations are on the basis of \$2.30 for small lots at store.

Chicago.—Mills are unable to keep pace with the demand, due in part to shortage in Steel. The demand is unusually large, and jobbers' stocks are depleted of salable sizes. Quotations are as follows: Iron Cut Nails, car lots, to jobbers, \$2.30; to retailers, \$2.35; Steel, to jobbers, in car lots, \$2.20; to retailers, \$2.25.

Pittsburgh.—At the meeting of the Cut Nail Association, held last week, official prices were reaffirmed. Demand is reported to be quite active, and stocks held by the mills and jobbers are very light, especially on sizes for which there is the largest demand. The market is very firm, one or two leading Western Cut Nail mills asking a premium of about 5 cents a keg over regular prices. Quotations are as follows, f.o.b. Pittsburgh: Carload lots, to jobbers, \$2.05; less than carloads, to jobbers, \$2.10; less than carloads, to retailers, \$2.20. Iron Cut Nails at points west of Buffalo and Pittsburgh are held at 10 cents advance on Steel Cut Nails.

Barb Wire.—Mills are behind on deliveries owing to the early demand, which comes from a wide extent of territory. Slight premiums are being paid for reasonably prompt delivery. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots.....	\$2.15	\$2.45
Retailers, carload lots.....	2.20	2.50
Retailers, less than carload lots.....	2.30	2.60

Chicago.—From all sections of the country orders continue to come in large volume. Deliveries are retarded, and for spot shipments in many cases premiums are paid. We quote as follows: Jobbers, Chicago, car lots, Painted, \$2.30; Galvanized, \$2.60; to retailers, car lots, Painted, \$2.35; Galvanized, \$2.65; retailers, less than car lots, Painted, \$2.45; Galvanized, \$2.75; Staples, Bright, in car lots, \$2.25; Galvanized, \$2.55; car lots, to retailers, 10 cents extra, with an additional 5 cents for less than car lots.

Pittsburgh.—The early starting of spring weather has caused a notable increase in demand for Fencing Wire, which is now very heavy and on which the mills are behind in deliveries. This heavy demand is general over all parts of the country, and indications are that the mills will not be able to furnish Wire as promptly as wanted by the trade. The market is very firm, and slight premiums are asked over regular prices for reasonably early delivery. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots.....	\$2.15	\$2.45
Retailers, carload lots.....	2.20	2.50
Retailers, less than carload lots.....	2.30	2.60

Smooth Fence Wire.—Similar conditions, covering demand and deferred deliveries, that obtain in the Barb Wire market, are prominent in the market for Smooth Fence Wire. Demand is heavy and mills are behind deliveries. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carloads	\$1.85
Retailers, carloads	1.90

The foregoing prices are for base numbers, 6 to 9. The other numbers of Plain and Galvanized Wire take the usual advances, as follows:

	6 to 9	10	11	12	12½	13	14	15	16
Annealed.....Base.	\$0.05	.10	.15	.25	.35	.45	.55		
Galvanized....\$0.30	.35	.40	.45	.55	.65	1.05	1.15		

Chicago.—Factories and mills using Smooth Wire are urgently demanding shipment of delayed orders. More or less congestion exists, and it is not likely that the mills will be able to make much headway in the clearance of overdue shipments until there is some abatement in the great demand. Quotations are as follows: In car lots, to jobbers, \$2, f.o.b. Chicago, and to retailers, \$2.05.

Pittsburgh.—Demand continues heavy, and all the mills are very much behind in deliveries. There is a continued shortage in supply of Steel and cars are scarce, which is adding to the difficulty experienced by the mills in trying to make deliveries satisfactory to their customers. Prices are firm but unchanged. We continue to quote f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carloads	\$1.85
Retailers, carloads	1.90

The foregoing prices are for base numbers, 6 to 9.

Tool Chests.—The American Tool Chest Company, 200 West Houston street, New York, announces the following discounts on its line of Tool Chests, terms 30 days net, or 2 per cent. discount for cash in 10 days:

Complete with Tools.	Discount.
Boys' Chests, Nos. 55 to 0½ inclusive.....	50 %
Youths' Chests, Nos. 2A, 1A to 4 inclusive.....	35 %
Gentlemen's Chests, Nos. 4½ to 6½ inclusive.....	25 %
Farmers', Planters', Railroads', Miners' and Carpenters' Chests, Nos. 7 to 13 inclusive.....	20 %
Boys' Eureka Chests, Nos. 122 to 215 inclusive.....	40 %
Youths' and Gentlemen's Eureka Chests, Nos. 20 to 25 inc.)	

Empty Tool Chests.	
Youths', Nos. 2A, 1A to 4 inclusive.....	35 %
Gentlemen's, Nos. 4½ to 6 inclusive.....	25 %
Farmers', Planters', Railroads', Miners' and Carpenters' Chests, Nos. 7 to 13 inclusive.....	20 %

Rope.—Manufacturers are reporting a better demand as the season advances, and allude to the market as being quite firm, especially on Manila and Jute goods. Quotations are as follows: Pure Manila, 13 to 13½ cents; B quality, 12 to 12½ cents; Pure Sisal, 9¼ cents; No. 2 quality, 7¾ to 8 cents; No. 1 Jute, ¼ in. and up, 9 cents; No. 2 Jute, 8½ cents.

Window Glass.—It has been decided by the hand operated Glass manufacturers identified with the National Brokerage Company to close for the season not later than April 20. This is in pursuance of the agreement to close factories at such a time as the manufacturers' Wage Committee decided that sufficient Glass had been made to supply market requirements until time for resumption of operations next fall. There is some doubt expressed as to whether the officials of the Amalgamated Window Glass Workers' Association will permit the independent hand operated factories to be closed at the same time. It is reported that manufacturers' stocks of Glass are about the same as at the corresponding period last year, and that jobbers have not abnormally large stocks on hand. Jobbers' quotations from jobbers' list October 1, 1903, are as follows: Greater New York, 90 and 10 per cent. discount on all sizes, single and double strength; outside of Greater New York, 90 and 5 per cent. for single, and 90 and 10 per cent. discount for double strength Glass.

Linseed Oil.—While demand is of a hand to mouth character, as far as new business is concerned, crushers are offering no inducements in the way of concessions in prices to induce buying. New York quotations for jobbing lots are as follows, according to quality: City Raw, 42 to 43 cents per gallon; Out of Town Raw, 40 to 41 cents per gallon. Bofled Oil is 1 cent a gallon over Raw.

Spirits Turpentine.—Prices have eased off considerably, owing to local competition and lower quotations in the Southern market. The market is in an unsettled condition and the demand moderate. New York quotations are as follows, according to quantity: Oil Barrels, 71 to 71½ cents; Machine Made Barrels, 71½ to 72 cents per gallon.

Binder Twine.—Reported conditions of the wheat crop, while the damage is not as great as was first supposed, are not of a character to induce merchants to buy liberally. While there is some increase in the volume of business, it is on a conservative scale. The Western

market is reported weak, and it is understood that some distributors are not strictly living up to the accompanying schedule of prices:

	Cents per pound.
Sisal	9½ to 9%
Standard	9½ to 9%
Standard Manila	10%
Manila (600 ft.)	12½
Pure Manila	13½ to 14
Carload lots, ¼ cent less; 5-ton lots, ½ cent less, central delivery.	

Mrs. Potts' Sad Irons.—Enterprise Mfg. Company, Philadelphia, announced under date of March 25 an advance of 3 cents per set on Enterprise cold handle Sad Irons, when ordered in lots of less than 10 dozen sets.

Bolts and Nuts.—At the recent monthly meeting of the associated manufacturers of Bolts and Nuts a number of new lists were adopted covering lines on which there has previously been no recognized standard list or on which existing lists were somewhat incomplete. The schedules adopted cover the following lines: Blank Bolts, Steel Boiler Bolts, large Forged Nuts and Cold Punched Chamfered and Trimmed Hexagon Tapped Jam and Check Nuts.

Horse Nails.—Several leading manufacturers of Horse Nails have made a concerted advance of 10 per cent. in certain of their corresponding brands of Nails.

Screws.—No change in the Screw market developed from the regular meeting of manufacturers held in this city last week. Prices are firm and the volume of business is above normal.

Tubular Rivets.—There seems to be no change in the situation on Tubular and Clinch Rivets, which have for many months been selling at low and irregular prices. Some manufacturers who have been producers of this class of goods in the past are now out of the market, apparently preferring to devote their attention to more remunerative lines. For this reason, as well as on account of the heavy demand, manufacturers now making these classes of Rivets are receiving an enormous business, and are said to be unable to handle all that is offered them. Some well informed persons express the belief that before long prices are likely to work higher.

Picks, Mattocks, Grub Hoes, &c.—Manufacturers of Picks, Mattocks, Grub Hoes, &c., have effected an advance in their prices approximating 5 per cent. Following the change, the market to the retail trade may be represented in a general way by a discount of 70 and 5 to 70 and 10 per cent.

Crow Bars.—An advance of 10 cents per 100 lb. in the price of Crow Bars has just taken place. Quotations to the retail trade range from 2¼ to 3 cents per pound.

Wedges.—A concerted advance of 10 cents per 100 lb. in the price of Wedges has been made by leading manufacturers. Oil finish Wedges may now be quoted to the trade at 3 cents per pound, although many jobbers are probably in a position to shade this price.

Smith & Wesson Revolvers.—A change in the price of their revolvers has just been announced by Smith & Wesson, Springfield, Mass., who have made a general advance of \$1 per piece in their list prices.

On April 1 the style of the Zephyr Ventilator Mfg. Company became the Zephyr Ventilator & Mfg. Company, Wayne Junction, Philadelphia, Pa., having taken over the plant of the National Tool & Stamping Company at that point. The company also manufactures the Zephyr Window Ventilator and the Philadelphia Radial Lamp Holder.

The store of the Lightbourn & Pond Company, Hardware and Agricultural Implements, New Haven, Conn., was destroyed by fire, together with its contents, March 31, with loss of \$35,000. The store had recently been stocked for the spring trade.

CHAS. O'BYRNE has succeeded A. C. Risley, New Milford, Pa., in the Hardware, Tinware, Implement, Paint and Sporting Goods business.

TRADE WINNING METHODS.

This department is for the description of approved methods of carrying on and extending business, and a cordial invitation is given to merchants to co-operate in the effort to make it suggestive and of practical use to the trade.

THE RIGHT SORT OF ADVERTISING.

BY O. B. JAMES.

THE rules governing advertising may be derived from ethics, aesthetics, rhetoric and the all-embracing science of psychology. Ethics teaches us, and practical experience proves her teachings sound, not to misrepresent our wares and to advertise nothing that we cannot deliver. Rhetoric teaches us to employ simple, well chosen words, arranged in a manner that will convey our meaning to the most simple minded reader. Aesthetics teaches us to arrange our cuts and text, select our type and border so as not to offend the eye.

But psychology, that deepest of all sciences, that science which treats of the influence of mind over mind, is the science that governs that indefinable, subtle influence that you find in some advertisements and find lacking in others; the science that draws, attracts, brings results.

Merchants' Constituency Should Be Studied.

We know that there is a vast difference in the tastes of people. What would be attractive to one might be repellent to another. And the advertiser must study his constituency. What might appeal to a man would be treated with indifference by a woman, and *vice versa*. In the country women are confined more closely in household duties, while the men can hitch up and go to town when they please. In the city the opposite is true. The men are confined to the office or shop during business hours, while the women are free to do the shopping.

Hence in the city the women are the purchasing agents, while in the country the men do the bulk of the buying. A woman will buy 10 things she does not need, because they are cheap, while a man will pay 10 prices for a thing that he needs, if it pleases him. Did you ever see a man fighting, scratching, elbowing to get first place at a bargain counter?

Mentioning Prices in Advertisements.

We are advised by some writers to "advertise prices or do not advertise." Others tell us that if we quote prices we "detract a man's mind from the article advertised and put it on his pocketbook." Which advice shall we follow? Follow both to a certain extent—quote prices in one advertisement and talk quality in another. Cater to both classes of trade. But if you quote prices be sure that they are attractive, and if you talk quality let it be on something of real merit; something that you can convince your customer is cheap at any price; but do not try to combine the two ideas in one advertisement.

Write Cheerfully and Truthfully.

In writing an advertisement of the latter type, write in a pleasant, cheerful manner; try to instill that drawing power, that substitute for personal magnetism which under the circumstances you are unable to exert. If you start your advertisement with a statement let it be one the truth of which cannot be doubted. If you start it with a question let it be one that can be answered in the affirmative only.

Negative vs. Affirmative.

Suppose, for instance, you are advertising a furnace, and start your advertisement in this manner: "Do you want a cold, chilly house? Do you want your plants and vegetables to freeze? If not, buy a Blank furnace of Jones & Co." All that would be necessary to completely congeal your reader would be an accompanying cut of a

*half-starved, cadaverous looking family shivering over a register in a cheerless room. Suppose you advertise the same furnace in this manner: "Do you want a warm, cheerful home with plants and vegetables free from frost? If so, buy a Blank furnace of Jones & Co." And accompany it with a cut of the family circle, comfortably seated in a bright, cheerful room, some reading, others sewing and baby playing with the kitten. Which advertisement would appeal to you were you in the market for a furnace?

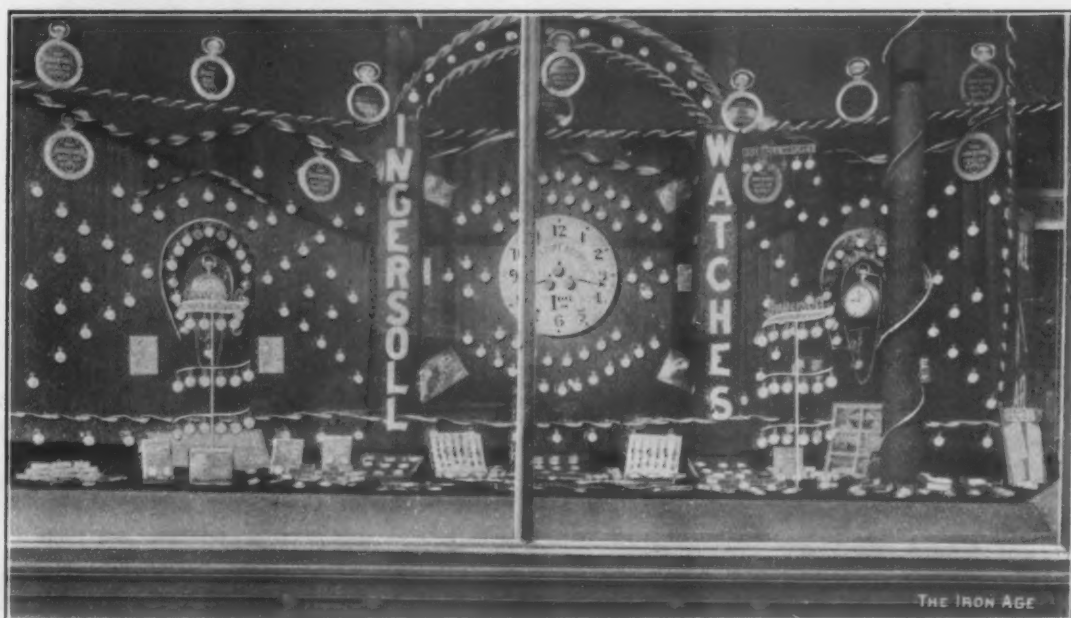
An Advertisement that Missed Fire.

Advertisements that attract attention do not necessarily attract trade. I noticed the other day a half-page advertisement in a prominent daily. In the center of the advertisement was the picture of a skeleton seated at a table. It attracted my attention, but that was all. I could not turn the page too quickly. I didn't stop to see what was advertised. People as a rule are not looking for trouble, discomfort or death, and it does not

to-the-point character. In the lower left hand corner on the folder front is the title, "Something for the Economical Buyer—Facts and Figures to Make You Think."

WATCHES IN WINDOW DISPLAY.

AN attractive display of Watches is reproduced herewith, as prepared by the Albany Hardware & Iron Company, Albany, N. Y. The background was black bunting with red crêpe paper for a contrasting color. For a centerpiece an arch was erected, the lettering on the two pillars being cut out of cardboard. In the center of the background a large card was placed representing a Watch face, and on it was the inscription: "Good Time Keepers for \$1.00." Nickel display fixtures were used throughout the trim, supporting dozens of Watches. Altogether about 350 Watches were called into service, as well as a number of fobs and chains. The exhibit occupied the window for 19 days, and during this period



Display of Watches in Window of Albany Hardware & Iron Company.

pay to advertise to the few who are. 'Tis the optimist, not the pessimist, that we are after.

Concentrate the Reader's Mind.

If you are advertising an article of merit—something that commands a good price—advertise it singly and take up your other wares in subsequent issues. Concentrate your reader's mind upon that one article and avoid mentioning too many of its good qualities—better select its most commendable feature, and let your arguments bear upon that. It is easier to clinch one idea in the cranium of a reader than it is to convince him of many. Do not confuse him. Remember that you are more familiar with the article than he is, and consequently more capable of understanding its many points of worth.

Advertising is a science worthy of association with those upon which volumes have been written. We who are spending 12 hr. a day doing up Nails, loading Stoves and reminding our delinquents that "we need the money" cannot hope to become experts, but we can by a little thought make our advertising profitable.

THE PETERS HARDWARE COMPANY, "Emporia's Busy Corner," Emporia, Kan., issues a postal folder, which on opening out measures about 13 x 28 in., the size going through the mails being about 6½ x 9½ in. It calls attention to Farm Machinery, Ranges, Fencing, Harness, Buggies, &c., prices being announced in some instances. Many illustrations are presented, and the accompanying enlightening data is of an interesting and

a large number of Watches were sold. The windows of the company are 10 ft. wide and 4 ft. deep.

H. S. NEWCOMER, Mount Joy, Pa., dealing in Hardware, Agricultural Implements, Wagons, Harness, &c., has issued a well printed catalogue of nearly 60 pages, 9 x 6 in., in which special prominence is given to articles and lines the sale of which he controls in his section of the country. Running all the way through the catalogue at irregular intervals is an elaborate alphabetical list of all the articles carried in stock by Mr. Newcomer, which he thinks will be of interest to many people who are not familiar with his varied and comprehensive line. A yellow slip in the catalogue, addressed to "Dear Friend" and signed "The Catalogue," begs the recipient not to visit destruction on the book—"If it don't interest you now" it "might come in handy some other time." The catalogue makes no mention of prices, and on the last page gives an index to the special goods to which it is devoted.

THE STUDEBAKER BROS. COMPANY of New York, at Broadway and Forty-eighth street, New York, representing the Studebaker Bros. Mfg. Company, South Bend, Ind., is about to occupy the entire building, seven stories, including two basements, at 36 Warren street, in this city, as a downtown branch, of which William R. Bishop will be manager. Vehicles of all kinds made at the works will be dealt in, from farm wagons to carriages and automobiles, together with harness.

DEATH OF JOHN BUNCE.

JOHN BUNCE died at his home in Brooklyn, N. Y., March 26, in his ninety-first year. He was born in New York, November 21, 1816, and with his wife was to have celebrated the sixty-fifth anniversary of their wedding on April 23. He had lived in Brooklyn for over 70 years, and had been in the Hardware business on lower Fulton street for more than 65 years. Mr. Bunce was educated in the public schools of Manhattan. When he came to Brooklyn it was so small a place (population about 15,000) that the method of crossing the East River to New York was by means of a horse (ferry) boat. Mr. Bunce used to go to New York, buy his goods and then put them on a wheelbarrow and cart them to the ferryboat, and thus get them to Brooklyn. At that time he kept a boy, who watched the store while he visited New York.

The deceased was originally apprenticed to a carpenter, who in a business transaction took a Hardware store in payment of a debt, and put young Bunce in

J. H. Williams & Co.'s Drop Forging Plant.

THIRD ARTICLE.

In the first article general reference was made to the admirable arrangement and appointments of this modern plant. The noteworthy provisions made for the comfort and welfare of the large force of employees were also gone into with some detail. The second article described the office library, the stock clerk's office and store-rooms.

THE establishment of a large manufacturing plant, yielding not only a profit on the investment, but keeping prominently in mind provision for comfortable and sanitary surroundings, with resulting contentment among the operatives, necessitates business acumen of high order.

A marked faculty of the late J. H. Williams was



Fig. 13.—Finishing Department.

charge of it. Mr. Bunce enjoyed the confidence of wholesalers in New York to such an extent that when goods were being ordered for him a common remark was: "Is it for Bunce, John Bunce, that you are buying? Well, John Bunce can have the whole establishment if he wants it." Mr. Bunce was a man of the strictest honor and enjoyed the society of some of Brooklyn's most prominent residents. He is survived by a widow and three sons and two brothers, both of the latter being over 80 years old.

Hayhurst-Gallaway Hardware Company, Loup City, Neb., has succeeded to the Shelf Hardware, Stove, Implement, Sporting Goods and Harness business of E. S. Hayhurst. A new brick store is being occupied 50 x 100 ft. in size and finely fitted up.

The Farmers' Hardware & Implement Company has been incorporated at Hydro, Okla., with a capital stock of \$10,000. The company will handle Shelf and Heavy Hardware, Stoves, Farm Implements and Sporting Goods.

the ability to choose sound and enduring business methods, retained permanently only after thorough trial, and he gathered about him a working staff of competent assistants, who in an atmosphere of such conditions have by their long association acquired the spirit and methods which have hitherto characterized the house. Under the supervision of such a force the business is being conducted by the company's officials, represented not only in the Board of Directors, but in the department heads, who, like many of the workmen, have been long in the concern's employ.

Board of Directors.

The Board of Directors, as now constituted, is as follows: George Amborn, president; James H. Williams, son of the founder; William A. Watson, Benjamin Whitaker, Hugh Alkman and Albion M. Tilton, all of whom are active in the management of the company.

Departments.

The operation of the manufacturing portion of the business is under the general direction of the superintendent, who is assisted by the heads of the various departments, the principal ones of which are: Tool making, die making, blacksmiths', forging, grinding and polishing,

hardening and tempering and finishing. Some of these are subdivided into other departments. The stock, shipping and receiving departments are more especially under the immediate supervision of the office departments.

The intent of this description is to reproduce some of the forms used and explain such of the methods in operation as are of an administrative and commercial character, rather than describe the actual and complex technical processes of manufacture. As a glimpse of the producing portion may be of interest, however, a par-

Packing and Shipping Room.

The packing and shipping room, to which everything for shipment goes, contains many facilities for expeditiously forwarding goods. Boxes of many sizes, barrel heads, &c., are stored in overhead racks, and for small or tall ends of shipments a suitable package, box, barrel or keg is used to insure a good fit, thus economizing transportation charges and keeping the goods intact. An apparently trifling but valuable feature is the transmission of a "Packing Memorandum on Order," a printed slip



Fig. 14.—Die Making Department.

tial view of two departments is here given—the finishing department, third floor of the main building, Fig. 13, and the die making department, second floor, same building, Fig. 14. The views afford some conception of the facilities possessed by these branches. In Fig. 13 are seen long rows of milling machines and other devices necessary in finishing processes. The die making department, on the floor below, occupies a similar amount of space. On the first or street floor of the new main building are located several departments, among which are pack-

4 x 6 in. containing an enumeration of quantity, goods and series or numbers, dated, giving order number and signed by the packer. This slip is rolled and inserted in a strong double pasteboard tube $\frac{3}{4}$ x 4 in., which both protects the slip and calls attention to its presence. Such a memorandum is packed in every shipment, so that some means for accurately checking off the goods by the receiver is at hand on their arrival at destination. From this it is possible to check up the extended invoice when it is received by mail, the former being shown in Fig. 15. The labels for packages for express shipments are gummed by a special label machine, and where goods are sold and priced by count, more especially the smaller articles, there is a system of checking the output.

(To be continued.)

AMONG THE HARDWARE TRADE.

Under the name of the Oregon Hardware & Implement Company, H. T. Fraser has opened a General Hardware store at Hermiston, Ore., and will handle Builders' and Shelf Hardware and Farm Machinery.

Wolgast & Schade, dealers in Hardware, Stoves, Implements, Paints, Sporting Goods and Saddlery at Alta Vista, Kan., have been succeeded by A. H. Wolgast.

The Hardware, Implement and furniture business at Montrose, Mo., formerly conducted by Utterson & Mohler is now owned and carried on by Mohler & Dugan.

The Hanson Hardware Company, Milnor, N. D., was recently incorporated with a capital stock of \$15,000, the incorporators being Ole Hanson, A. A. Newgaard, C. A. Hanson, W. G. Rosenow and J. Houghlin.

G. W. Miller has purchased the Hardware stock of F. H. Gage, at Bristow, Iowa, and will continue the business as heretofore, carrying a full line of Shelf and Heavy Hardware, Pumps and Farm Machinery.

The Love Furniture Company, Cleburne, Texas, has recently commenced the Hardware and furniture business.

J. H. WILLIAMS & CO.,		
Brooklyn, New York. Dec 31/06		
Packing Memorandum on Order.		
No. 47234		
Quantity.	Goods.	Size or Nos.
100	Inf. Wornicks	# 11
250	" "	9
700	" "	27
1100	Eyeballs	5

The above quantities have been carefully verified by weights; and this memorandum should be returned with claims for shortage.

J. Johnson Packer.

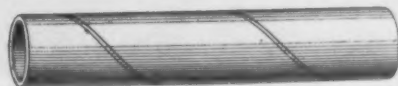


Fig. 15.—Packing Memorandum and Protecting Pasteboard Tube.

ing and shipping, trimming, lacquer, chief stock clerk's office, supply room and a well planned system of stock holding bins, supplementing a much larger bin capacity in the basement below. The older main building joined to the latest structure contains the repair shop.

UTILIZING A COUNTER FRONT.

IN a crowded store where economy of space must be constantly studied and where it is important that all available room should be utilized, good use may be made of the front of the counters which usually extend down one or both sides of the store. Here, with the aid of brackets, some merchants erect shelves on which samples may be displayed. Some merely set up brackets or harness hooks without shelves, on which they lay such stocks as Transom Lifts, Weather Strips, Long

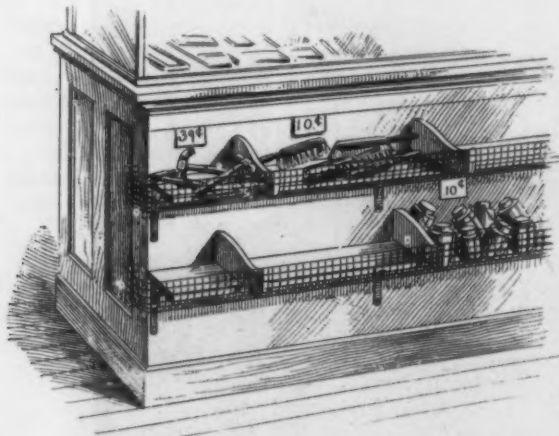


Fig. 1.—Compartments in Counter Front.

Handles and the like. Others put up rows of small hooks on which Lanterns, Pails, Coal Hods, coils of Wire and many other things may be hung.

J. R. Satterthwaite, who operates a Hardware and Seed store at Trenton, N. J., has a novel way of utilizing a counter front which not only increases its capacity for accommodating stock, but also brings prominently before customers articles of every day requirement, leading by suggestion or reminder to many purchases which would not otherwise be made.

Wire Basket Front.

Two rows of shelves are erected on the front of the counter with brackets, as shown in Fig. 1. Cellar Window Wire 1 ft. wide is tacked onto the bottom of the shelves near the outside edge, running out 3 or 4 in., and then being bent up in front forming a sort of Wire basket front on the shelf proper. Partition boards are then put in at intervals, making a series of compartments in

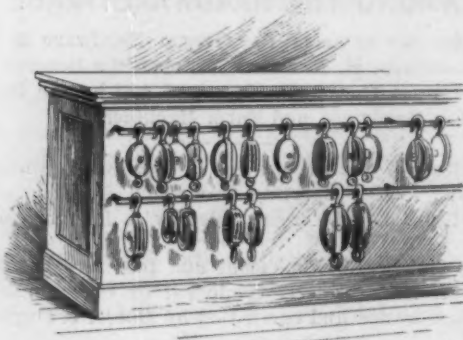


Fig. 2.—Tackle Blocks Hung from Barn Door Track on Counter Front.

which are kept all sorts of articles in common use, such as Hammers, Tack Pullers, Sink Scrapers, Brushes of all kinds, Glue, &c., &c.

The price of each article is displayed on pasters on the edge of the shelves, affording customers information without inquiry and at the same time encouraging a purchase, because, as a rule, the prices are very low. A customer, in fact, will often help himself and give the money to a clerk. Thus the

Firm Makes Many Side Sales

aggregating considerable profit which would not be made if the article and the price were not brought to the customer's notice, and all without requiring much time or attention on the part of the clerks. It may fairly be believed that two or three times as many such cheap articles are sold as would be if the stock were kept out of sight.

While the use of the Cellar Window Wire to form the compartments is an easy and inexpensive method, especial advantage is found in the facility with which the compartments may be kept clean. There is no place for dust to collect except on the shelf near the face of the counter, and from here it may readily be brushed out, so as to sift through the meshes of the wire to a dust pan held underneath or to the floor.

Blocks on Barn Door Track.

In the back part of this store the front of a counter is used for accommodating Pulley Blocks, as shown in Fig. 2. Two lengths of O. N. T. Barn Door Track are erected one above the other with the ordinary bracket hangers, affording space for a large number of Blocks where they are accessible and can be readily compared. The rail has many advantages for this purpose, as it is thin, so as to accommodate small hooks, and will not sag as will long pieces of bar iron or pipe.

REQUESTS FOR CATALOGUES, Etc.

The trade is given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.

REQUESTS for catalogues, price-lists, quotations, &c., have been received from the following houses, with whom manufacturers may desire to communicate:

FROM W. P. CUNNINGHAM, who has removed his Hardware business from Colton to Spokane, Wash.

FROM BALDWIN BROS., who have purchased the Hardware, Stove, Implement, Paint, Sporting Goods and Harness business of L. F. Corbitt, Ainsworth, Neb.

FROM M. HIRSCH, Bloomington, Neb., who has bought the Hardware, Implement, Sporting Goods and Vehicle business of L. A. Sievel.

FROM THOS. NELSON, Springfield, Neb., who has bought the Hardware, Stove and Sporting Goods business of Kieck & Bates.

FROM BOYD & BRODT, who have purchased the business of Axtell Hardware Company, Axtell, Kan.

FROM JACOB H. OHMER, Jersey City, N. J., formerly with John H. Menagh & Co., who has recently begun business in general Hardware, House Furnishing Goods, Factory, Contractors' and Engineers' Supplies, Paints, &c.

FROM S. E. SPERRY, Clarinda, Iowa, who has bought the Shelf and Heavy Hardware, Stove, Tinware, Plumbing and Sporting Goods business of Dunlap & Co.

FROM M. A. SCHLICK, who has bought the Hardware, Stove, Implement, Paint and Sporting Goods business of F. G. Berridge, Purcell, Kan.

FROM TRIPLETT HARDWARE STORE, J. A. Triplett, proprietor, which has succeeded Triplett & Merrifield in the Shelf Hardware, Stove, Harness and Sporting Goods business at Triplett, Mo.

The general Hardware stock and business of M. Pastoret, Hibbing, Minn., has been purchased by C. L. Thoun, who will refit the store throughout with modern shelving and fixtures, steel ceiling and new glass front. A sheet metal and tin shop will be operated in connection with the store.

HARDWARE CLUB OF NEW YORK.

THE fifteenth annual meeting of the Hardware Club was held in the club quarters Saturday, March 16. A feature of the occasion was the election of six governors, five of whom were re-elected. The governors whose terms had just expired were A. D. Clinch, T. F. Curley, H. L. Freeland, F. B. Griffin, J. D. Foot and J. H. Ken-

The nonresident class continues about the same as formerly, making a total of about 700 in the club.

At a subsequent meeting of the Board of Governors, Thursday, March 21, the following officers were elected: Eugene Bissell, president; Thomas F. Keating, vice-president; A. D. Clinch, treasurer, and Arthur G. Sherman, secretary.

Eugene Bissell, the new president, senior partner in



EUGENE BISSELL.



THOMAS F. KEATING.

nedy. Mr. Foot, owing to frequent absences from the city, refused to be considered for another term, but the remaining five of the group were returned to the board for three years. Edward Stagg of Patterson Bros. was elected a governor for one year to complete the unexpired time of the late Robert Sickels.

The various annual reports of President Varick, Treasurer Keating and Secretary Sherman indicate that

the house of E. Bissell & Co., was one of the six incorporators in 1892, always one of the governors and has been chairman of the House Committee since he succeeded Peter McCartee in that position about 1893. Associated with him from the beginning on this committee have been E. C. Van Glahn, J. L. Varick and Arthur G. Sherman.

Thomas F. Keating, the new vice-president, is also



ALFRED D. CLINCH.



ARTHUR G. SHERMAN.

the club is exceptionally prosperous, both as to finances and membership. The membership, in the fifteenth year since organization, continues at the full 600 in the resident class, as it has been for seven years past, with a waiting list of over 25 per cent., there having been an ever increasing waiting list since the limit was reached.

one of the 15 original trustees named in the club's incorporation papers, and has been continuously a member of the Board of Governors ever since and until the last meeting held the office of treasurer. In business he had been prominently identified with the Yale & Towne Mfg. Company from 1869 to 1900, when he went into

business for himself. In 1902 he organized the J. M. Mossman Company, 23 Warren street, New York, for the manufacture of Bank and Safe Locks and other locking devices, and is secretary and treasurer of the company.

Alfred D. Clinch of Underhill, Clinch & Co., the present treasurer, was also one of the original six incorporators. He has always been an efficient member of the Board of Governors. Since 1899 he has been chairman of the Committee on Admissions, and was chairman of the Library Committee from 1894 to 1897, inclusive. Mr. Clinch has also looked after the compilation of the club manual, which is an excellent example of exactness.

The secretary, Arthur G. Sherman, is now serving the club for the seventh successive term. He has always been a governor and always a member of the House Committee. He is the representative here of the Ames Shovel & Tool Company (Wright Shovel Company plant), with office at 168 Church street.

DEATH OF JOSEPH WILLIAMS.

JOSEPH WILLIAMS, one of the founders of the old Hardware business of the Burditt & Williams Company, Boston, died at his residence, Cambridge, Mass., March 27, aged 73 years. He was born in Boston, April 1, 1833, and about 1850 entered the employ of M. C. Warren, a well-known Boston Hardware merchant. In 1857 Charles A. Burditt also entered Mr. Warren's service, so that he and Mr. Williams were storemates for three years before they entered into the business relationship which was to continue for so many successful years. On April 2, 1860, having bought out the Hardware business of Otis Vinal, 20 Dock square, which he had conducted for 20 years, Mr. Burditt and Mr. Williams established the firm of Burditt & Williams in the store which they occupied for nearly 46 years. James A. Munroe, who had been with the firm for 12 years, was admitted to partnership in 1886, and in 1900 Joseph H. Williams, who was not born when the firm was established, was made a member. The business was incorporated in 1901 as the Burditt & Williams Company, the four partners being the sole incorporators. The present store at 4 High street was opened in 1903 and there the business is now carried on.

Mr. Williams and Mr. Burditt had been associated as partners for 47 years, lacking six days, and as daily associates for nearly half a century. This record of harmonious connection is the more remarkable from the fact that in all but the last year of this long period they were established in one store.

The record is quite in keeping with the history of the old store on Dock square, which was known as a Boston Hardware store as early as 1796, when it was occupied by Joseph Scott, Jr. His successors were: John Odin, 1800; T. W. Haskins & Co., 1829; Otis Vinal, 1840, and Burditt & Williams, 1860. There was ample warrant for the sign which for several years capped the store: "A Hardware Store for One Hundred Years." On April 2, 1900, the firm signalized the completion of 40 years of business life by a reception which was attended by many of the personal and business friends of Messrs. Burditt and Williams, who crowded the old store.

In his 50 years in the Hardware business Mr. Williams was a witness, with a few other survivors, to the great changes which have been wrought in its conditions. He began when imported Hardware filled the shelves, and lived to see it wholly displaced by the products of American factories in a variety and elaboration of styles and patterns wholly undreamed of. He was naturally brought into intimate relations with the leading manufacturers and their representatives, with whom, by his genial manners and inexhaustible good nature, he was a marked favorite, and by whom he will be held in affectionate remembrance.

Mr. Williams was a Mason, and a member of Amicable Lodge of Cambridge and of Boston Commandery, Knights Templar. For 50 years he attended the Old Cambridge Baptist Church. He leaves a widow, three sons—Joseph H. Williams, Rev. Charles B. Williams,

West Royalston, Mass., and David B. Williams, Bedford, Mass.—and two daughters.

GRAPHOPHONES IN HARDWARE STOCKS.

A CONTINUALLY broadening field in merchandising has led many enterprising, energetic Hardwaremen into stocking and marketing, profitably, various lines of manufactures that even in the more recent past had not been regarded as within the scope of a Hardware store stock. The marked increase in the purchasing power of the American public has made possible the carrying of numberless lines previously considered as out of harmony with relatively more prosaic staples in Hardware, and which afford much better opportunities for increasing both sales totals and the percentage of profit.

One of several such lines taken up by Hardwaremen, largely in the Western States, but also in other sections, is the Graphophone. The Columbia Phonograph Company, 154 Nassau street, New York, as sole sales agent for the American Graphophone Company, Bridgeport, Conn., has just made an important advance in the matter of records by the introduction of the Marconi Velvet-Tone Disk Records. These are for use in connection with the Columbia Graphophone, named in honor of the wireless specialist, who is also under contract with the company as consulting physicist for a term of years for services relating to sound waves and their application to the company's talking machines. The newest feature in the business of the company is the Disk Record, as now made for the Columbia Graphophones. These Records weigh but 2 ounces each, are very flexible, and, it is stated, will endure bending, dropping and knocking about without appreciable impairment, and are practically unbreakable. As they are lighter in weight than any Disk Records previously made they can be economically mailed as well as forwarded by express or freight.

Still more important to the purchaser is the melodious quality of the tone which more closely than ever before resembles the human voice, rendering vocal and instrumental sounds without the inseparable mechanical and scratching features heretofore present. The music from these Disks can be acceptably repeated hundreds of times, and it will satisfactorily respond to the same needle over and over again, instead of necessitating the irksome renewal of the needle by the substitution of a new one whenever another Record is used.

The Records as now made are jet black in color, and made of a peculiar substance by a secret process, and it is asserted by the company will stand with impunity exposure to all sorts of weather and climate. So far, samples of them have been shown only in a comparatively few remote places. The Graphophones or Talking Machines, in which the Records are used, are listed variously at \$20, \$30, \$40, \$45, \$50 and \$100 each. John S. Leng's Son & Co., 33 Murray street, New York, are now carrying the Machines and a complete stock of Records, both Disk and Cylinder, for the trade in this territory.

THE STREVELL-PATERSON HARDWARE COMPANY, Salt Lake City, Utah, has increased its capital stock from \$200,000 to \$500,000, instead of \$300,000, as recently noted in these columns. This material increase in capital will enable the company to develop and extend its business in the new territory which is being opened up tributary to Salt Lake City.

NEWARK LEATHER WASHER COMPANY, Newark, N. J., has been succeeded by Standard Leather Company, which is carrying on the business at the same location.

FRANK & DE KEYSER, 174 Fulton street, New York City, who deal largely in Hotel Ware and Supplies, will on or about May 1 remove to 33 Park place.

EDWARD SIMON, Toledo, Ohio, has sold his Hardware, Stove, Paint and Sporting Goods business to W. H. Harvey and C. C. McGregor, both of Carsonville, Mich. The business will be conducted in the future under the style of Harvey & McGregor and will be managed by C. G. Burton.

Export Trade Topics.

NEW YORK EXPORT HOUSES AS AGENTS FOR FOREIGN MERCHANTS.

EXPORT houses may be broadly divided into four classes. First the export merchants proper; those buying and stocking goods for their own account, either in their New York or some foreign office. Second, the American branch offices of foreign merchant houses, maintained here for purposes of buying and forwarding their requirements. Third, American houses which act or claim to act exclusively as agents for certain American manufacturers in foreign fields. Fourth, the export commission houses. Of these houses about nine-tenths have their headquarters in the City of New York.

Differentiating the Groups.

The export merchants proper are very few in number. It may be doubted whether more than half a dozen, perhaps not more than two or three, make a practice of buying goods for their own account or to carry in their own stocks. American buying offices of foreign merchant houses are similarly few, as yet, although they have notably increased in numbers within the last few years, and a further development in this line is almost certain in the future. American houses who pose strictly as agents for certain American factories are also limited in number, and, as a matter of fact, merge themselves more or less into the fourth class, or export commission houses. In the City of New York there may be 300 or 400 houses making pretensions to be included in one or the other of the four classes named, as devoting themselves exclusively to foreign commerce. A great majority fall under the head of export commission houses, although lines of distinct division are sometimes hard to draw.

Export Commission Houses.

No greater misapprehension exists among manufacturers interested in export relations than that which is so general as almost to be the rule in regard to the position, functions and value of the export commission house. How to govern relations with them is a question deserving a good deal of thought, and something may be said on all sides. The present observations are prompted with the idea of informing those unfamiliar with their work as to some aspects of the export commission house, and it is proper to say are based on an actual experience in some of them extending over several years and a rather intimate acquaintance with their composition and methods.

Much Foreign Trade Developed by Commission Houses.

To the great credit of the export commission houses let it be confessed at the outset that a very large part of the foreign business of the United States, and above all in Hardware lines, is undoubtedly due to them rather than to the individual effort or enterprise of the manufacturers themselves. In former days the effort of the manufacturer who had gained the idea that his goods might be marketed in foreign countries was practically confined to a canvass of the New York commission houses, endeavoring to interest them in calling the attention of their foreign clients to the manufacturer's wares. This is still the limit of the enterprise of too many manufacturers, in spite of the fact that export conditions have radically changed. Too many manufacturers snatch greedily at the bait of "prompt cash in New York," "no necessity of attention to shipping, insurance, foreign credits or foreign correspondence." Too many are satisfied with a limited or purely incidental business, too many inordinately vain of a few thousand dollars' worth of foreign business a year, when it might well be several times as large.

Permanency of Export Commission Houses.

The export commission houses are probably a fixture. It may well be doubted whether their numbers or the aggregate of their business will be seriously curtailed in future years, even though their position and their functions must change further in ways already developing. There are two distinct phases of commission house work, separate, yet often intermingling, as the purchasing agents in America of their foreign clients, and as a selling organization. In one instance they simply execute the indents with which they are intrusted; in the other they strive more or less intelligently to interest the foreigner in new goods and in increasing their general business. In both cases their pretension is that they grant their clients the very best cash prices in any way obtainable, charging them for their services in shipping and financing a commission on the net values of invoices, usually 2½ per cent. As purchasing agents it is undeniable that the commission houses have a very appreciable value to those foreign merchants who transact a miscellaneous business with this country, handling a multiplicity of small lines, with no very considerable relations in any one of them sufficient to justify individual shipments or special arrangements with separate manufacturers. It is undoubtedly on this account that many, or most, manufacturers of Hardware are to-day doing the greater part of their foreign business through commission houses.

Past Conditions.

Many years ago a young man, who knew nothing of export business beyond a conviction that more of it was to be won by aggressiveness, started on a foreign trip with many cases of samples representing a "combination of manufacturers"—manufacturers as ignorant of conditions as he was himself. That young man returned in a year, a convert to the commission house idea. He had constantly encountered from his customers the objection, "Yes, I could buy some of that line, but not enough to make it worth while; not enough to make a shipment"—and the young man had made no arrangements for forwarding composite shipments.

Knowledge Still to Be Acquired.

On another occasion, a New York salesman for an out of town house, on attempting to interest a foreign merchant visiting the city on a buying trip, was met with the request to bring his samples down to the office of a certain commission house. "But why?" he persisted. "Why do the business through them and pay them a commission; why not do it direct with us?" "Young man," was his reply, "I tried that and gave it up years ago. Your American manufacturers don't know how to ship; don't know the difference between a bill of lading and an insurance policy; don't know how to get their money after they have shipped; don't know how to draw a draft or negotiate it; don't know how to write a letter. I would rather pay a commission and have my business attended to in a businesslike way." That is surely a rather strong indictment. Yet in the past facts have justified it.

Commission House of the Future.

As the purchasing agents of foreign clients, then, the commission houses have a role that will always justify their existence, even though it is being curtailed by the establishment in New York of their own buying agencies by foreign merchants transacting a large enough business to make such a branch office profitable, in comparison with the commissions heretofore paid commission houses. This may not unlikely have the effect, as time elapses and the number of these New York agencies increases, of restricting the commission house connections to foreign houses of smaller caliber, and their business is undoubtedly being cut into seriously by the constantly increasing effort of manufacturers to develop direct connections with foreign buyers of their goods, but with it all the commission house is quite sure to remain and to merit a certain amount of consideration. The question is, What sort of consideration?

Limitations of Commission Houses.

The advantage of a commission house as a forwarder of small or sundry lots of goods is undeniable and considered as purchasing agents for foreign clients it is, indeed, possible for them to bring a manufacturer's catalogues or circulars before such clients. But as a means of advertising, the commission houses are insignificant, and the manufacturer who relies exclusively upon them will make a very serious mistake. It is an easy matter for the manufacturer to obtain the addresses of foreign customers likely to be interested in his goods, and if he will approach them direct he will have all the advantage of a personal and technical acquaintance with his line, that ability to drive home in his letters the strong "talking points" usually lacking in the commission house. Let it be well understood, the commission houses in this respect exercise little influence on their foreign customers. The latter are business men who buy what they think they can sell profitably, no matter who presents it to them. One of the worst features of our commission houses to-day is the fact that but comparatively few of the proprietors, officers, or even heads of departments are personally familiar with the territories in which they work, or have any actual acquaintance with the majority of their customers or even with the character and extent of their customers business. The heads of more than one New York commission house have never set foot outside of the United States. Some, and they of the class usually dignified as "large," have made no more than a single foreign trip, and that of limited extent and duration and more for recreation than business purposes. One is constantly finding men engaged in business with South America who cannot understand a word of their customers' letters until translated for them, and others doing business with Germany who ridicule "Dutch" in order to cover up their own lack of knowledge. It may be asserted that as a rule comparatively few of the commission houses are better acquainted with most of their customers than is possible through the exchange of correspondence, and that they exert no influence whatever upon their customers so far as making purchases go. The burden of developing and increasing his foreign business rests, and ought to rest exclusively, on the manufacturer. A friendly relation with commission houses will do him no harm, may possibly be of benefit, but upon the manufacturer himself must depend any noteworthy expansion of his business.

Manufacturers Trading Direct.

Indeed there exists no good reason why the manufacturer should not disregard the commission houses altogether in cases where he produces articles that are commonly ordered in quantities sufficient to constitute a minimum bill of lading, say, 60 cu. ft., or if he has other means of forwarding smaller quantities without incurring prohibitive freight charges. Apart from this consideration of forwarding miscellaneous lots of small packages, the commission house does little or nothing for the manufacturer that he cannot do equally as well or better for himself. If willing to give considerable study to this very serious question.

Credits.

It is a common impression that the commission house grants credit to its customers. It is scarcely ever the case. Commission houses almost invariably sell on the basis of sight drafts attached to shipping documents, or drafts at 30, 60 or 90 days, and practically all these drafts are sold to New York bankers, and their proceeds cashed within a day or two of the ship's departure with the goods on board. The manufacturer himself can similarly and quite as readily finance his own shipments and be assured. If he has carefully investigated his customer, he will run no greater risk even in the case of time drafts, documents for acceptance, than the commission house readily accepts in consideration of a prospective profit of from 2½ to 5 per cent., or in very large transactions for as little as 1 per cent. or even less. And the manufacturer almost always has all of the facilities

for investigating a customer's financial standing that the commission house has, barring the results of former trading, since but few of their customers are personally known to them.

Correspondence.

ADHERENCE TO MANUFACTURERS' BRANDS.

To the Editor: The communication signed "Manufacturers' Brands," in your issue of March 14, reminds me of a similar case. A relative, about 10 years ago, began making an office specialty, and after investing his capital in finished goods started out to solicit trade. After three months' hard work he came to me in an unhappy state of mind, saying he could not interest the dealers or jobbers.

The Old, Old Story.

They said: "There is no sale for a new article of that type; the market is flooded, and when you have created a demand we will take it up." As this quotation embodied a part of his conversation with me, I asked: "Well! Why not make a demand? Hire girls and give each a territory to cover, stores and office buildings, and then come to me in one month; in the meantime I will give you addresses and letters of introduction to personal friends."

What Happened.

In less than one month he was deriving considerable income from his specialty, and jobbers came to him. As

he thought favorably of my judgment his first question was: "Would you sell dealers or go ahead and sell consumers only?"

My reply was to "make a dealers' price and another to jobbers based on quantity purchased." As the goods were put up in packages of 100 and 10 packages to a carton I suggested giving 10 per cent. discount on 10 cartons and 10 and 10 per cent. discount on 100 cartons; this would show whether jobbers were

earnest in their desire to work for him. He followed the plan of making proportionately graded discounts for quantity orders, still employing

his office-to-office saleswomen, and after 10 years is assured of a lucrative business.

Individuality Preserved.

He has never heeded requests, demands and threats to make brands; always insisted on name and address, both street and number, being on each package, consequently he gets a large amount of foreign business which might not have reached him. Therefore I agree with "Manufacturers' Brands" that the way to create a demand is to sell the goods, leaving the middle man alone, for, sooner or later he will get in line and ask for the goods sold under the manufacturers' brand. I could cite several instances of this kind; three in the Hardware line and the other a maker of Gas Engines.

T. A.

THE DILLON HARDWARE & ENAMEL COMPANY, Indianapolis, Ind., has recently incorporated with a capital stock of \$10,000, to engage in the manufacture of High Grade Cooking Utensils. A jobbing business will also be done in Hardware, Glass and Woodenware.

F. E. MYERS of F. E. Myers & Bro., Ashland, Ohio, is prominently identified with the consolidation of Ohio traction interests, which will be known as the Cleveland, Southwestern & Columbus Traction Company.

THE stock of the Wilson Hardware Company, Hamlin, Texas, was recently purchased by Frank Martin, who will continue the business as heretofore.

ONTARIO RETAIL HARDWARE ASSOCIATION.

THE Ontario Retail Hardware Association held its second annual convention at Toronto on March 28 and 29, about half of the members being present. The meeting was a very interesting and useful one. The association was organized on April 13, 1906, with about 20 members. The membership is now about 175, including some of the largest firms in the province.

President's Address.

In his annual address, President Humphries outlined the progress which had been made since the organization was formed. He referred to the successful outcome of the efforts made by the association to induce the Postmaster-General to abandon his expressed intention of introducing a bill with a c. o. d. clause attached, permitting large parcels to be sent by post at a very cheap rate. He said that good feeling and good fellowship had been marked characteristics of the gatherings of the association, and that this spirit would serve materially to increase its strength. "When we all shove together,"



W. G. SCOTT, President.

he remarked, "we should be able to remove large obstacles."

Secretary's Report.

Secretary Weston Wrigley reported as follows, in part:

As we are passing the first mile post in the history of the association, it is well to analyze the results of the year's work. First of all it must be admitted that the work of organizing has been well commenced. If a capable organizer could take the field for a couple of months following this convention I feel certain that the province could be thoroughly organized. Already good work has been done by the organization of district associations in several sections of the province. These district associations should be organized in all parts of the province.

Another feature of the organization work is the progress which has been made toward bringing into existence a Dominion association, which will unite all Hardwaremen in the different provinces into one organization.

THE GREATEST SUCCESS SO FAR SECURED

by our association is in the matter of the parcels post c. o. d. agitation. Our association was the first to take up this matter and in spite of the refusal of the Retail Merchants' Association to co-operate, we conducted the campaign so vigorously that the Postmaster-General was forced to withdraw the legislation aimed to benefit the mail order houses at the expense of the retail trade throughout the country. If for no other reason this work has been sufficient warrant for the existence of the association, as it can safely be said that had the retail Hardwaremen in Ontario not organized a year ago the parcels post c. o. d. legislation would now be in force.

SELLING TO CONSUMERS BY JOBBERS AND MANUFACTURERS.

What is the most important work for the coming

year? During the past 12 months the greatest attention has been given to the cartage charges and parcels post question. The cartage charges question should be pushed to a satisfactory conclusion, but in the secretary's opinion it is far overshadowed in importance by the greater evil of jobbers and manufacturers selling to consumers. During the coming year this should be the all-important subject under consideration.

Until the criminal code is changed there can be no price agreement adopted by our association. There is, however, no reason why arrangements cannot be made to have wholesalers' and jobbers' list dealers adopt a special scale of prices for selling goods to contractors and others who buy to use and not to sell again. Consumers who buy in large quantities are undoubtedly entitled to closer prices than ordinary buyers, but the retail trade should be protected and the existing evil of consumers buying as cheaply as retail dealers should be ended if the retail trade is to continue a factor in commercial life.

OUR RELATIONS WITH JOBBERS

have been friendly during the past year, although matters of controversy were taken up at the very inception of the retail association. This has probably been the reason why the traveling salesmen have not aided our organization as much as the travelers have aided the retail Hardware associations in the United States and western Canada. Jobbers, however, are far seeing business men and undoubtedly realize that anything the Retail Hardware Association does to better the conditions of the retail trade is bound to have its effect in improving the field for business operations of the wholesale houses. As has been pointed out before, retailers and wholesalers should co-operate together in checking the present tendency of jobbers selling to consumers and retailers buying from manufacturers.

National Retail Association Proposed.

The Executive Committee in its report outlined the actions of the committee on the various matters which had been taken up, the jobbers having been asked to abolish cartage charges at point of shipment and to discontinue selling to consumers. The Enameled Ware manufacturers were asked to stamp "seconds" in plain letters and the Dominion and Provincial governments had been approached in the matter of legislation affecting the retail Hardware trade. The executive had also taken up the matter of forming a national retail association and made the following recommendations:

That our newly elected president and secretary be the Ontario representatives on the temporary executive of the national body.

That Toronto be the headquarters of the proposed Canadian Retail Hardware Association.

That each province be entitled to two representatives.

That the national body be financed by an assessment of 25 or 50 cents per member in order to carry on its business and oppose all injurious legislation.

That the proposed temporary executive endeavor to organize a retail Hardware association in each province in Canada and by an interchange of experiences strengthen the existing associations.

The Western Canada Retail Hardware Association has already appointed its president and secretary as its representatives in this movement. After discussion these recommendations were concurred in.

Cartage Charges.

Correspondence was read from the Wholesale Association and from the Railway Commission in the matter of cartage charges and the following resolution was adopted:

Resolved, That this association being still of the opinion that the sending forward, on the bill of expense of the consignee, of the cartage at shipping point is a gross injustice to the retailer, reaffirm our intention to oppose this unjust condition and authorize the executive to carry the matter again before the Railway Commission and to take whatever action they deem advisable.

Jobbers Selling to Consumers.

A long discussion took place on this subject, numerous instances being given of jobbers going after the trade of consumers and failing to protect their retail customers. It was stated by several delegates, however, that as a direct result of the work of the Retail Hardware Association, even though its membership is yet small, the jobbers are becoming more careful in this matter. A motion that "all complaints should be sent to the secre-

tary, and that he should notify the members by circular regarding houses complained of, the matter then to be dealt with by the executive" was carried.

Another motion prevailed that the executive impress upon the Enameled Ware manufacturers the necessity of making better "firsts," and of stamping all "seconds" as such.

Mutual Insurance.

Reports were received from the Account Collection and Mutual Insurance Committees. The former favored the adoption of a system of collecting through form letters provided by the secretary, and the latter stated existing laws prevented the establishment of mutual insurance companies by merchants in Canada without special legislation. Efforts had been made to arrange with some old line company to accept the insurance of several hundred Hardware merchants on a satisfactory basis, but so far without success. It is now proposed that a joint stock company be formed by association members as soon as enough are enrolled to guarantee success.

Travelers as Members.

The matter of accepting travelers as associate members was decided in the negative, as it was felt that the travelers would prefer to keep outside, and their admission would look as though the retailers were trying to hold them up for membership fees.

Election of Officers.

The election of officers resulted as follows:

PRESIDENT, W. G. Scott, Mt. Forest.
FIRST VICE-PRESIDENT, J. R. Hambly, Barrie.
SECOND VICE-PRESIDENT, J. Walton Peart, St. Mary's.
SECRETARY, Weston Wrigley, Toronto.
TREASURER, John Canlor, Toronto.
EXECUTIVE COMMITTEE: A. W. Humphries, Parkhill; D. Brocklebank, Arthur; F. Taylor, Carleton Place; G. A. Binns, Newmarket; H. Becker, New Hamburg; W. A. Mitchell, Kingston.

The sum of \$50 was placed in the hands of the executive to provide some suitable souvenir to be tendered the secretary for his active work during the year.

Question Box Discussion.

Friday afternoon was devoted to Question Box discussion, the following being the principal points brought out:

"What System of Accounting Is the Best for a Hardware Store?"

Replied to by J. Walton Peart, St. Mary's, who gave a practical talk on modern bookkeeping methods, contending that not more than 50 per cent of Hardware merchants were capable of keeping a thorough set of books, and it was consequently necessary to adopt every labor saving device and work out a system to meet the needs of the store. Mr. Peart said the ideal way to handle sales is by cash registers, the savings on the cash checks being more than sufficient to pay the interest on the investment. In charging accounts the best method is to use an ordinary counter check book, following this up by registering the amount on a charge key of the cash register for reference in the office. The speaker said he had saved \$300 last year by taking all his cash discounts, and pointed out that taking these discounts only meant advancing a certain sum for one or two months. In the ordinary course a man starting in business in December would have his accounts due on March or April 1. By paying on February 1 he would get his discounts. Then every succeeding month payments would be made as usual. The cash discounts saved would amount to extraordinary interest on the amount invested in making the advance payments.

Should Large Retailers be Able to Buy Goods as Cheaply as Jobbers, or, in Other Words, is the Quantity System of Buying the Most Satisfactory Manufacturers can adopt?

This was replied to by James Purvis, Sudbury, who contended that each dealer should have a good understanding with the jobber he deals with, as jobbers aid the retailer in many ways. Stock can be kept up best by buying in large quantities. As a rule, it pays best to buy from the jobber, but many lines must be purchased from the manufacturer in quantity.

J. R. Hambly, Barrie, said many large dealers did a jobbing trade in their district and could buy cheapest from manufacturers. He would lose all his mill trade if

he was not able to buy from the manufacturer in quantity.

To What Extent does it Pay a Hardware Dealer to Advertise in the Local Newspaper? What Forms of Advertising Have Been Found the Most Profitable? Is it Profitable to Advertise in Programmes?

E. W. Brocklebank, Arthur, in answering this question said his firm used a space two columns wide in his local paper, the amount varying according to the season. Best results were secured from newspaper advertising as, except in rare instances when a special sale could be announced, programme advertising was wasted money. An unpriced catalogue gotten out by his firm three years ago had brought good results, it merely illustrating the lines carried in stock and giving "reasons why" it would pay to buy from them. Personal letters to men building barns, painting, installing heating apparatus, &c., also brought business. Last Christmas his firm had purchased 5 gross of Vases at \$7 per gross, and these had been given away judiciously in pairs to customers with good results. No advertising was attached. He did not consider calendar advertising a paying proposition for the retailer, although his firm used calendars supplied by manufacturers of Paints, &c., they having a mailing list of about 1200 names.

Should the Head of a House Devote His Greatest Attention to Buying Right or to Looking After the Selling End?

In replying to this Frank Taylor, Carleton Place, said if a firm was buying in quantity it would undoubtedly pay best to look after that end. Ordinarily, however, the average dealer should spend his greatest time in buying until he masters that end. Then it will pay to look after customers and see that sales are well made and no good sales are lost. Credit buyers want to deal with the head of the house.

What Percentage of a Merchant's Turnover Should His Expenses Be?

J. R. Hambly, Barrie, said his experience was that a man doing a \$50,000 business should spend at least one-tenth that amount. Eleven per cent. of his turnover was the lowest he had succeeded in getting.

Do 5 and 10 Cent Counters Pay in Small Towns?

A. W. Humphries, Parkhill, said he had found bargain counters good business bringers, as well as valuable in helping to get rid of unsalable articles, particularly in dull seasons and at stock taking time. Apart from the bargain feature, it was a good advertising device, and the goods in many cases sold themselves.

Should Goods Be Marked in Plain Figures?

W. B. Clifton, Alliston, who replied to this question, strongly advocated plain figures, as it helped to inspire confidence among customers, it proved honesty and it enabled the parcel boy to help in selling goods. He also found it a good plan to have a woman clerk to sell Kitchen Goods, Cutlery and similar lines.

Delegates Banqueted.

On Thursday evening the delegates to the convention were tendered a complimentary dinner by the staff of *Hardware and Metal*, nearly a hundred retailers and jobbers accepting the invitation. Col. J. B. MacLean was toastmaster, "The Retail Hardware Association," "The Wholesale Hardware Association," and "The Traveling Salesmen" being successively toasted. Addresses were delivered by Past President Humphries, President Scott, Vice-President Peart and Secretary Wrigley of the Retail Association; Vice-President T. G. Dexter and James Hardy of the Wholesale Association, and A. R. Hatch and E. Fielding of the Commercial Travelers' Association. A feature of the dinner was the menu, got up with many catchy sayings referring to the work of the Retail Association.

The Perkins Hardware Company, Youngstown, Ohio, was incorporated recently with a capital stock of \$30,000 by George R. Perkins, superintendent of the blast furnaces of the Youngstown Steel Company; Joseph R. Perkins, John R. Perkins and James and J. R. Woolley. The company has selected a site for a store and business block and will probably build next fall.

PRICE-LISTS, CIRCULARS, Etc.

Manufacturers in Hardware and related lines are requested to send us copies of catalogues, price-lists, &c., for our Catalogue Department in New York; and at the same time to call attention to any new goods or additions to their lines, of which appropriate mention will be made, besides the brief reference to the catalogue or price-list in this column.

S. STERNAU & Co., Brooklyn, N. Y.: Illustrated booklet entitled "To the Progressive Housewife," referring to Coffee Machines, Percolating Coffee Pots and Coffee Services.

HUNT, HELM, FERRIS & Co., Harvard, Ill.: Catalogue No. 29, covering an extensive line of products, including Star Haying Tools and Corn Huskers, Barn Door Hangers, Star Door Hinges, Star Hand Sleds and Coaster Wagons, Tank Heaters, Wire Stretchers, Windmill Regulators, &c.

CLYDE CUTLERY COMPANY, Clyde, Ohio, U. J. Ulery Company, 7 Warren street, New York, agent: Catalogue No. 14, illustrating and listing a line of Butcher Knives, Corn Hooks, Pruning Shears and Tree Trimmers.

SARGENT & Co., 94 Centre street, New York: Illustrated catalogue of Wire Screen Hardware and other spring and summer goods for 1907.

NORVELL-SHAIPLEIGH HARDWARE COMPANY, St. Louis, Mo.: Bicycle catalogue showing the company's line for 1907, with illustrations giving the exact color of the goods. Also catalogue of spring and summer Sporting Goods, including some special goods at very low prices.

J. S. WOODHOUSE, 189-191 Water street, New York: Pamphlet O, dated March, 1907, referring to specialties in Agricultural Implements for the farm, field, garden, &c.

A. S. MORSS COMPANY, Boston, Mass.: Pocket catalogue of Marine Hardware, Boat Builders' Supplies, Motor Boat Fittings and Appliances, Edge Tools, &c.

BUTLER BROTHERS, Chicago, Ill.: April issue of catalogue styled "Our Drummer," referring especially to spring and summer goods.

GEUDER & PAESCHKE MFG. COMPANY, Milwaukee, Wis.: Cloth bound illustrated catalogue of nearly 300 pages referring to an extensive line of Stamped and Pieced Tinware, Japanned Ware, Enameled Ware, Sheet Iron Ware, Antirust Tinware, &c. The catalogue is an attractive one and very conveniently arranged. With the issue of this volume the company passes into the second quarter century of its existence.

JOHN S. LENG'S SON & CO.

JOHN S. LENG'S SON & CO., 33 Murray street, New York, have just issued an illustrated catalogue of their entire line, which is accompanied by a small separate booklet containing actual net selling prices or discounts, following page for page the catalogue itself, so that the book with list prices can be shown a customer without detriment. The matter is compactly arranged, and includes comprehensive lines of Steel Tubing, Bicycles, Tires, Graphophones and Records, Guns, Revolvers, Exercisers, Key Blanks, Bicycle Supplies, Siphon Pumps and Automobile Supplies. This business was established in 1852, and in later years has taken over many competitors in the Bicycle line. An important recent addition is a line of Columbia Graphophones of the Columbia Phonograph Company, which is the sole sales agent of the American Graphophone Company. This line is especially recommended by the above firm to the Bicycle trade as a great help in paying expenses during the long winter months when Bicycle riding is checked by snow and bad roads.

The Bennett Brothers Hardware Company, Meridian, Miss., has recently been incorporated with a capital stock of \$10,000, and will engage in a general Hardware and mercantile business. The incorporators are D. E. Bennett, T. G. Bennett and James Bennett.

THE UNION FORK & HOE COMPANY.

THE UNION FORK & HOE COMPANY was organized on March 21, at Columbus, Ohio, under the laws of the State of Ohio, with a capital of \$1,100,000. This company has acquired the Continental Tool Company, Frankfort, N. Y.; the United States Hoe & Tool Company, Columbus, Ohio, and some small interests. All of the plants will be enlarged and improved. E. A. Cole, formerly president of the United States Hoe & Tool Company, will be at the head of the new company, and T. F. Connors, formerly secretary of the United States Hoe & Tool Company, will hold the same position with the new concern. The headquarters of the company will be at Columbus, Ohio.

C. E. JENNINGS & CO.'S NEW CATALOGUE.

C. E. JENNINGS & CO., 42 Murray street, New York, have just issued an illustrated descriptive catalogue of 174 pages containing the goods of their manufacture, produced at their factories in Yalesville, Conn.; Hinsdale, N. H., and Port Jervis, N. Y., together with many staple articles of Hardware made in Southington, Conn. The articles consist principally of Mechanics' Tools and Hardware Specialties, including Saws, Chisels, Drawing Knives, Augers, Bits, Squares, Tool Chests and kindred goods. There are many new goods, including Brace and Bit Extensions, Pyramid Tool Sets, Chisels and Gauges, Folding and Adjustable Handle Drawing Knives, Handled Cabinet Scrapers, Steel Squares in intermediate sizes, Try and Miter Squares, T Bevels, Tool Holders, &c.

MISCELLANEOUS NOTES.

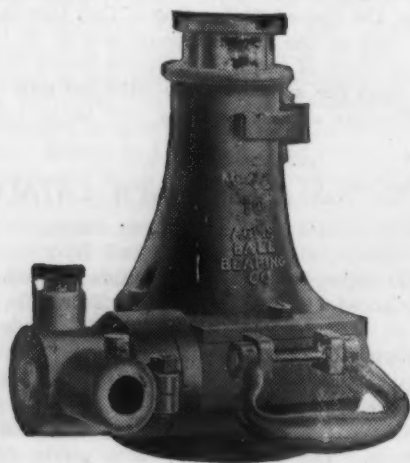
Coffield Power Washing Machine.

P. T. Coffield & Son, Dayton, Ohio, manufacturers of the Coffield power washing machine, are sending out an attractive booklet describing this machine and illustrating it in natural colors. The machine is operated by a small motor of few parts and simple construction, which is driven by city water pressure. The motor is made of brass throughout, doing away with the possibility of rust, and is mounted on the lid of the tub, making a compact, light machine which can easily be moved about by the laundress. The tub is substantially built of Louisiana cypress and handsomely finished. It is bound with heavy hoops, and every part is reinforced where this would be advantageous. The machine is connected to the ordinary faucet by a hose, and when not in use can be set aside out of the way. Hose is also used to conduct the exhaust water to the sink after it has passed through the motor. By opening or closing the faucet, the speed can be regulated to suit any material, and the manufacturers state that the washer will cleanse lace curtains or heavy double blankets with equal ease and without danger of damage.

Acme Ball-Bearing Jack.

The Acme Ball-Bearing Company, Chappaqua, N. Y., represented by the Acme Ball-Bearing Sales Company, 56 Warren street, New York, has just put on the market an improved Acme ball-bearing jack, No. 40, here illustrated. The standardization of cars by leading railroads to carry 50 to 75 tons of freight, in addition to weight of car itself, has created a demand for a quick action, ratchet jack, powerful enough to lift the necessary proportion of such great weights, usually about one-sixth of the total; light enough to carry about readily, and reasonable in price. The great power available in this jack is attributed by the company to the use of a worm gear which ordinarily, while powerful, requires more time in operation than is convenient. This feature is overcome in this mechanism by the employment of a quadruple thread on the screw post and a double thread on the worm, the gear having but 20 teeth. This jack is also provided with an automatic brake, which, it is said, makes the jack safe under all conditions and places it under the absolute control of the operator. Another im-

portant feature of it is that the head can be almost instantly put in contact with the load before applying the pressure to lift it. The ratchet can be reversed by a simple movement of thumb and finger. The raceway is made of chrome steel, the post and ram of machinery steel and the gear is a steel forging. All working parts, including ratchet, are entirely protected and all parts work in grease, which cannot come in contact with the



Acme Ball-Bearing High Duty Jack.

person. The jack is 10 in. high, closed; 15 in. high, extended; $5\frac{1}{4}$ in. diameter of base; weighs but 43 lb., and has a lifting capacity of 20 tons. Owing to its great lifting power and comparatively light weight, this jack is especially recommended by the company for railroad work in lifting car trucks to replace journal brasses on loaded cars containing 100,000 lb. of merchandise and over, in addition to weight of car itself. The jack can be used in any position—up, down or as a side lift.

Enameled Wash Boiler.

Cleveland Stamping & Tool Company, Cleveland, Ohio, is putting on the market the new enameled wash boiler here illustrated. This is made of No. 18 gauge steel and is 14 x 18 in. in size and 10 in. deep. It is enameled white inside and chocolate color outside. The cover is also enameled and boiler and cover are equipped with strong handles. The manufacturers' argument in favor



Enameled Wash Boiler.

of this boiler is that it can be so thoroughly cleaned after use in the laundry that it can be brought into service for cooking or any purpose where a large vessel is needed. They suggest for instance that on the farm, when threshing day comes around, it is very convenient for use in preparing a big dinner, especially in cooking vegetables, soup and coffee. When so ordered boilers can be fitted with an end faucet, at a slight addition to the regular price.

BARNES MFG. COMPANY, Mansfield, Ohio, is sending out an attractive circular referring to its improved hydraulic rams. The feature of the circular is an ingenious illustration and diagram showing how the rams

may be operated. They are recommended for supplying water to residences, factories, villages and railroads as well as for irrigating, &c. The circular also contains a complete general description of the ram, with directions and specifications for locating and ordering and price-list, repair price-list and table of efficiency.

V Sash Cord Fastener.

H. M. Altick, Dayton, Ohio, manufacturer of hardware specialties, is putting on the market a patented fastener for sash cord which is illustrated in the accompanying cuts. It is V shaped, as indicated by the name, and is said to afford a firm and effective fastener without knot and to be exceptionally simple and easy to in-

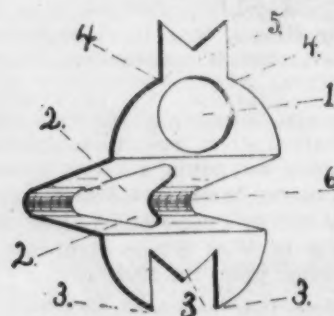


Fig. 1.—V Sash Cord Fastener.

stall. Referring to Fig. 1, the cord is passed through the hole 1, then around and into the V shaped aperture marked 2-2, with the end of the cord resting against the points 3-3-3. A side view of the fastener, with the cord in place, is given in Fig. 2. When the cord is in position the fastener is inserted in the hole usually bored into the edge of the sash, thus pressing the cord firmly into the aperture 2-2 and tightly clinching the points 3-3-3 into the cord, so as to hold it firmly against the hole in the sash. With the weight of the sash and the sash weight upon the fastener the shoulders 4-4 are embedded



Fig. 2.—Sash Cord Fastener with Cord in Place.

into the wood of the sash, where the groove for the cord enters the hole, thus pressing the tightened cord against the extension 5 and preventing any loosening of the fastener or any scraping against the frame. At its upper bend through the aperture 1 the cord rests against the wood of the sash instead of the edge of the iron, thus preventing chafing. The maker states that this fastener will fit any size hole usually bored in a window sash and will take any size cord from No. 6 to No. 10, owing to the flexible bend at 6. When firmly fixed in the sash the fastener is said to be absolutely immovable when in position, but it can readily be removed by a slight downward pull, thus permitting the removal of sash for painting, &c.

Marlin No. 20 Repeating Rifle.

The rifle shown in Fig. 1 is an addition to the line of the Marlin Fire Arms Company, New Haven, Conn. It is a 22 caliber take-down arm operated on the trombone principle and weighs about 4 lb. 2 oz. Fig. 2 shows the rifle taken down. The length of the gun over all is 39¼ in.; length taken down, 26 in. The barrel is octagonal, 22½ in. long. The frame is said to be of the best quality gun frame steel, blued finish, the small working parts are of the best quality crucible steel and

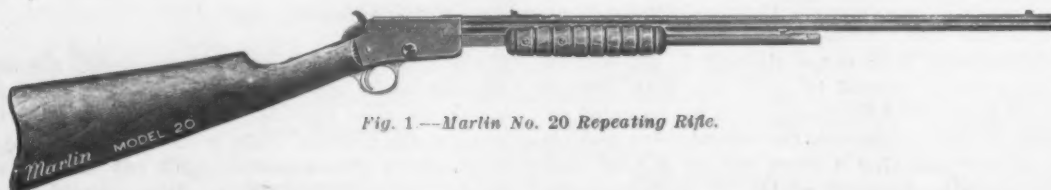


Fig. 1.—Marlin No. 20 Repeating Rifle.

the flat springs of imported Jessop's spring steel. The buttstock is black walnut, 13¼ in. long; drop at comb being 1 9-16 in.; drop at heel, 2¼ in. There is a steel buttplate, blued finish. Extras such as selected wood, checking, &c., can be furnished as ordered. The rifle has a tubular magazine holding 15 short, 12 long or 11 long rifle cartridges which may be used indiscriminately. There is an ivory bead front sight and adjustable flat top rear sight. The rifle has a solid top which does not catch rain or snow and keeps a wall of metal between one's head and the cartridge, preventing powder and gases from blowing back in the face. There is a side



Fig. 2.—No. 20 Rifle, Taken Down.

ejector which throws the shells away from and not into the face and eyes. The regular closed-in Marlin breech is used. The gun is declared to be of first-class material at every point, finely balanced, quick and easy of operation and especially adapted to small game and gallery work.

Waterproof Battery Set.

In offering the battery set here represented, A. S. Morss Company, Boston, Mass., suggests that it is pretty hard to find a dry place in a small launch, when it is really rough. At such times the batteries often become short circuited and give out when they are most needed. This



Waterproof Battery Set.

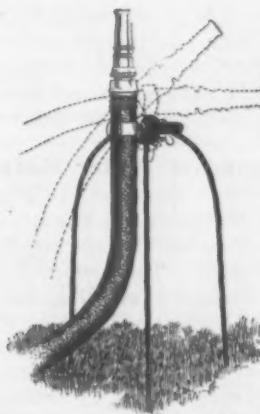
battery is declared to be absolutely impervious to dampness and moisture and will even work under water. Two sizes are made, containing six and eight dry cells, respectively. They are packed in a wooden box connected up and flooded with the company's special insulating waterproof composition. The slightly increased first cost of

this battery is said to be more than offset by its longer life and greater reliability, as its full life is available for ignition. The company also puts out a 26A and a 27A Edison spark waterproofed in the same way.

At-water Combination Hose Holder and Spray Stand.

Osborn Mfg. Company, Cleveland, Ohio, manufacturer of foundry supplies and hardware specialties, is putting

on the market the At-water combination hose holder and spray stand here shown. The device is said to be a simple one, consisting only of a tripod and holding clip adjusted by a thumb screw. The tripod is of steel and iron construction, with brass adjusting parts. It is 14 in. high and finished in a bright serviceable green. The holder will accommodate, it is said, any of the regular hose nozzles and will hold them in any desired posi-



At-water Combination Hose Holder and Spray Stand.

tion. The stand can be transferred from one part of the lawn to another without turning off the water and without the attendant getting wet. There is ample room under the stand for placing the hose in an upright position, so as to secure a fountain spray. The legs of the stand are sharp pointed and will hold it firmly in the ground under any water pressure.

UNITED STATES CLOTHES PIN COMPANY, Montpelier, Vt., is steadily increasing its output of United States clothes pins, which the trade will recognize as consisting of wooden jaws operated by a galvanized steel wire spring. These pins are not pushed or crowded over a fabric in fastening it to a line, but can be clasped on without danger of injury to any delicate material, although they will hold securely to wire or rope lines even in a high wind. As a proof of the excellence of these pins the company states that it has never had a word of complaint from people using them, but has received many expressions of satisfaction.

CHANDLER & FARQUHAR COMPANY, Boston, Mass., is offering among its line of hardware specialties the Federal bench shear. This is described as a strong, neat, compact tool of ingenious design which will cut sheets or bars up to 3-32 in. thick or even thicker if the stock is soft. The tool stands 8 in. high and weighs only 30 lb. The company states that it is sold to an increasing extent by the retail and jobbing trade throughout the country.

Split Bamboo Fly Rod with Detachable Line Guide.

The combination split bamboo fly rod shown in Fig. 1 is No. 2362 of the line of fishing rods made by Clark-Horrocks Company, Utica, N. Y. It is a three-piece, de-



Fig. 1.—Combination Split Bamboo Fly Rod with Reducing Plug.

tachable grasp rod, with extra tip and is made from selected stock closely wound in green silk with English snake guides and welled ferrules. With the patented reducing plug, shown in the cut, the second joint and tip only can be used, making a short rod (7 ft.) of light caliber, but, as the company states, of perfect action. The grasp is reversible, having a screw-off butt cap, thus making the fly rod 9 ft. long, with reel seat either above or below the hand. The reducing plug fits into the end



Fig. 2.—Detachable Line Guide.

of the butt, where it is always ready for use, and there is little liability of loss. By the use of the company's new detachable line guide on the butt joint, as shown in Fig. 2, it is possible to change the rod from one length to another without unstringing the line.

Lippincott Water Motor.

Lippincott S. M. Company, Newark, N. J., has perfected and is placing on the market the faucet water motor here illustrated. The motor shown is equipped with an emery wheel for grinding, but the spindle is adapted for the attachment of polishing wheels of various kinds, and also to receive a pinion or worm to actuate a larger gear attached to the motor casing, thereby fitting the motor for the operation of ice cream freezers, coffee mills, washing machines and other devices requiring considerable power at slow speed. These countershafts are carried in stock to accomplish any desired reduction, from

4 to 1 to 80 to 1. The manufacturer states that the Lippincott motor is thoroughly well made, with heavy cast iron casing. The spindle is of steel, accurately finished, and rotates in brass bushings screwed-in, which may be removed and replaced when worn. The impact wheel has buckets of a well-known type, so formed as to divide the jet and throw it away from the path of the wheel after



Lippincott Water Motor.

motor at 80 lb. pressure will run a 10-in. lathe taking a 1-16-in. cut from a 1 1/4-in. steel shaft, but it is not recommended for such heavy service. The company also makes larger motors, up to 5 hp., suitable to run dynamos, printing presses, &c.

PAINTS, OILS AND COLORS

Animal, Fish and Vegetable Oils—

Linseed, City, raw.....	42	@43
City, Boiled.....	43	@44
State and Western, raw.....	40	@41
Raw Calcutta, in bbls.....	70	@71
Lard, Extra Prime, Winter.....	77	@78
Extra No. 1.....	56	@57
No. 1.....	50	@51
Cotton-seed, Crude, f.o.b. mills.....	35	@37
Summer Yellow, Prime.....	45	@46
Summer White.....	50	@51
Yellow Winter.....	50	@51
Sperm, Crude.....	59	@60
Natural Winter.....	72	@73
Bleached Winter.....	75	@76
Bleached Winter, Extra.....	76	@77
Tallow, Prime.....	61	@62
Whale, Crude.....	35	@36
Natural Winter.....	36	@37
Bleached Winter.....	48	@49
Extra Bleached Winter.....	50	@51
Menhaden, Brown, Strained.....	32	@33
Northern.....	32	@33
Southern.....	32	@33
Cocunut, Ceylon.....	9	@9 1/2
Cochin.....	10	@10 1/2
Cod, Domestic, Prime.....	38	@39
Newfoundland.....	40	@41
Red, Elaine.....	47	@48
Sapocilled.....	5	@5 1/2
Olive, Italian, bbls., Yellow.....	45	@46
Neatsfoot, Prime.....	56	@57
Palm, Logan.....	7	@7 1/2

Mineral Oils—

Black, 29 gravity, 58°30 cold test.....	114	@115
29 gravity, 15 cold test.....	124	@125 1/2
Summer.....	114	@115
Cylinder, light filtered.....	19	@20
Dark, filtered.....	16 1/2	@17 1/2
Paraffine, 903-907 gravity.....	14	@14 1/2
903 gravity.....	13	@13 1/2
883 gravity.....	11 1/2	@12 1/2
Red.....	13	@13 1/2

Miscellaneous—

Barytes:		
White, Foreign.....	12	@12.50 @20.50
Amer. floated.....	19	@20.00
Off color.....	13	@16.00
Chalk, in bulk.....	3	@3.00 @3.25
In bbls.....	100	@11.00 @17.50
China Clay, Imported.....	11	@11.00 @17.50
Cobalt, Oxide.....	100	@2.50 @2.60
Whiting, Commercial.....	100	@.43 @.52
Gilders.....	100	@.50 @.65
Ex. Gilders.....	100	@.60 @.65
Putty, Commercial.....	100	@1.00
In bladders.....	1.70	@1.85
In bbls, or tubs.....	1.30	@1.45
In 1 lb to 5 lb cans.....	2.65	@2.85
In 12 1/2 to 50 lb cans.....	1.50	@1.90
Spirits Turpentine.....	73	@73 1/2
In machine bbls.....	73 1/2	@74
Glue—		
Cabinet.....	12	@15
Common Bone.....	7 1/2	@9
Extra White.....	18	@24
Foot Stock, White.....	12	@14
Foot Stock, Brown.....	9	@11
German Hide.....	12	@18
French.....	10	@40
Irish.....	13	@16
Low Grade.....	10	@12
Medium White.....	11	@17
Gum Shellac—		
Bleached, Commercial.....	45	@47
Bone, Dried.....	35	@
Button.....	40	@60
Diamond.....	50	@60
Fine Orange.....	32	@57
A. C. Garnet.....	46	@47
Kala Button.....	35	@36
D. C.....	62	@63
Octagon B.....	56	@57
T. N. O.....	47	@48
V. S. O.....	59	@60
Colors in Oil—		
Black, Lampblack.....	12	@14
Blue, Chinese.....	36	@46
Blue, Prussian.....	32	@36

Blue, Ultramarine.....	13	@15
Brown, Vandyke.....	13	@14
Green, Chrome.....	12	@16
Green, Paris.....	24	@24
Sienna, Raw.....	12	@15
Sienna, Burnt.....	12	@15
Umber, Raw.....	11	@14
Umber, Burnt.....	11	@14

White Lead, Zinc, &c.—

Lead, English white, in Oil.....	9 1/2	@10
Lead, American White:		
Lots of 500 lb or over, in Oil.....	7 1/2	@8
Lots less than 500 lb, in Oil.....	8	@8
Lead, White, in oil, 25 lb tin		
pails, add to keg price.....	1 1/2	@1 1/2
Lead, White, in oil, 12 1/2 lb tin		
pails, add to keg price.....	1	@1
Lead, White, in oil, 1 to 5 lb		
ass'ted tins, add to keg price.....	1 1/2	@1 1/2
Lead, American, Tenuis: For lots 12		
tons and over 1/2¢ rebate; and 2% for		
cash if paid in 15 days from date of		
invoice; for lots of 500 lbs. and over		
2% for cash if paid in 15 days from		
date of invoice, for lots of less than		
500 lbs. net.....	5 1/2	@5 1/2
Zinc, American, dry.....	5 1/2	@5 1/2
Zinc, French:		
Antwerp, Red Seal, dry.....	8 1/2	@8 1/2
Antwerp, Green Seal, dry.....	10 1/2	@10 1/2
Paris, Red Seal, dry.....	9 1/2	@9 1/2
Paris, Green Seal, dry.....	11	@11
Zinc, V. M. French, in Poppy Oil:		
Green Seal:		
Lots of 1 ton and over.....	13 1/2	@13 1/2
Lots of less than 1 ton.....	13 1/2	@13 1/2
Zinc, V. M. French, in Poppy Oil:		
Red Seal:		
Lots of 1 ton and over.....	11 1/2	@11 1/2
Lots of less than 1 ton.....	12 1/2	@12 1/2
Discounts—French Zinc.—Discounts		
to buyers of 10 bbl. lots of one or mixed		
grades, 1%: 25 bbls., 2%: 50 bbls., 4%.		
Dry Colors—		
Black, Carbon.....	4 1/2	@4 1/2
Black Drop, American.....	4	@4
Black Drop, English.....	5	@5

Black, Ivory.....	16	@20
Lamp, Com.....	4	@6
Blue, Celestial.....	4	@6
Blue, Chinese.....	30	@33
Blue, Prussian.....	28	@32
Blue, Ultramarine.....	4 1/2	@15
Brown, Spanish.....	1 1/2	@1
Carmine, No. 40.....	33	@33.25
Green, Chrome, ordinary.....	3 1/2	@7
Green, Chrome, pure.....	17	@25
Lead, Red, bbls., 1/2 bbls., kegs.....	7 1/2	@7 1/2
Litharge, bbls., 1/2 bbls., kegs.....	7 1/2	@7 1/2
Ocher, American.....	10	@14.00
American Golden.....	2 1/2	@3 1/2
French.....	1 1/2	@2
Foreign Golden.....	3	@4
Orange Mineral, English.....	10	@12
French.....	10 1/2	@12
German.....	8 1/2	@10
American.....	8 1/2	@9
Red, Indian, English.....	4 1/2	@6
American.....	3	@3 1/2
Red, Turkey, English.....	4	@10
Red, Tuscan, English.....	7	@10
Red, Venetian, Amer.....	100	@10.50 @1.75
English.....	100	@11.15 @1.75
Sienna, Italian, Burnt and		
Powdered.....	3	@9 1/2
Italian, Raw, Powdered.....	3	@7
American, Raw.....	1 1/2	@2
American Burnt and Pow'd.....	1 1/2	@2
Talc, French.....	100	@25.00
American.....	100	@25.00
Terra Alba, French.....	100	@25.00
English.....	100	@25.00
American.....	100	@25.00
American.....	100	@25.00
Umber, T'key, Bnt. & Pow'd.....	2 1/2	@3 1/2
Turkey, Raw and Powdered.....	2 1/2	@3 1/2
Burnt, American.....	1 1/2	@2
Raw, American.....	1 1/2	@2
Yellow Chrome.....	13	@15
Vermilion, American Lead.....	10	@25
Quicksilver, bulk.....	65	@
Quicksilver, bags.....	65	@
English, Imported.....	65	@
Chinese.....	30.30	@1.00

Current Hardware Prices.

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer—are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 33% @ 33% & 10% signifies

that the price of the goods in question ranges from 33% per cent. discount to 33% and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued May, 1906, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—A new edition of "Standard Hardware Lists" has been issued and contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters, Blind—

Domestic, $\frac{1}{2}$ doz. \$3.00.....33%
North's.....10%
Zimmerman's—See Fasteners, Blind.
Window Stop—
Ives' Patent.....35%
Taplin's Perfection.....35%

Ammunition—See Caps, Cartridges, Shells, &c.

Anti-Rattlers—
Fernald Mfg. Co. Burton Anti-Rattlers, $\frac{1}{2}$ doz. pairs Nos. 1, \$0.75; 2, \$0.60; 3, \$1.00; 4, \$0.50.
Fernald Quick Shifter, $\frac{1}{2}$ doz. pairs.....\$2.00@3.00

Anvils—American—

Eagle Anvils..... $\frac{1}{2}$ lb. @ 9%
Hay-Budden, Wrought.....9%
Trenton.....9%

Peter Wright & Sons, $\frac{1}{2}$ lb. 84 to 340 lb. 11%
Anvil, Vise and Drill—
Millers Falls Co., \$18.00.....15%
Apple Parers—See Parers, Apple, &c.

Aprons, Blacksmiths—

Livingston Nail Co.....33%

Augers and Bits—

Com. Double Spur, 7045 @ 7045
Jennings' Patn., reg. finish.....60%
Black Lip or Blued.....65%
Boring Mach. Augers.....70%
Car Bits, 12-in. twist.....40%
Ford's Auger and Car Bits.....40%
Ft. Washington Auger Co., Concord's.....35%
Forstner Pat. Auger Bits.....25%
C. E. Jennings & Co.:
No. 10 ext. lip, R. Jennings' list, 25%
No. 10, R. Jennings' list.....40%
Russell Jennings.....25%
L'Hommedieu Car Bits.....15%
Mayhew's Counter-sink Bits.....45%
Pugh's Black.....25%
Pugh's Jennings' Pattern.....35%
Snell's Auger Bits.....35%
Snell's Bell Hangers' Bits.....35%
Snell's Car Bits, 12-in. twist.....60%
Snell's King Auger Bits.....50%
Wright's Jennings' Bits.....50%

Bit Stock Drills—

See Drills, Twist.

Expansive Bits—

Clark's small, \$18; large, \$28.....50%
Clark's Pattern, No. 1, $\frac{1}{2}$ doz. \$28; No. 2, \$18.....60%
Ford's, Clark's Pattern.....25%
C. E. Jennings & Co., Steer's Pat. 25%
Lavigne Pat., small size, \$18.00; large size, \$28.00.....60%
Swan's.....60%

Gimlet Bits—

Common Dble. Cut.....\$3.00@3.25
German Pattern, Nos. 1 to 10, \$4.75; 11 to 13, \$5.75

Hollow Augers—

Bonney Pat., per doz. \$5.50 @ 6.00
Ames.....25%
Universal.....20%
Wood's Universal.....25%

Ship Augers and Bits—

Ship Augers.....10%
Ford's.....35%
C. E. Jennings & Co.:
L'Hommedieu's.....15%
Watrous'.....35%
Snell's.....40%

Awl Hatts—See Handles, Mechanics' Tool.

Awls—

Brad Awls:
Handled.....gro. \$2.75 @ 3.00
Unhanded, Shlivered.....gro. \$3.00 @ 3.50
Unhanded, Patent.....gro. \$3.00 @ 3.50
Peg Awls:
Unhanded, Patent.....gro. \$1 @ 1.50
Unhanded, Shlivered.....gro. \$3 @ 3.50
Scratch Awls:
Handled, Com.....gro. \$3.50 @ 4.00
Handled, Socket.....gro. \$11.50 @ 12.00

Awl and Tool Sets—See Sets, Awl and Tool.

Axes—

Single Bit, base weights: Per doz.
First Quality.....\$1.75 @ 5.00
Second Quality.....\$1.25 @ 4.50
Double Bit, base weights:
First Quality.....\$7.00 @ 7.50
Second Quality.....\$6.50 @ 6.75

Axle Grease—

See Grease, Axle

Axles— Iron or Steel

Concord, Loose Collar.....45%
Concord, Solid Collar.....45%
No. 1 Common, Loose.....35%
No. 14 Com., New Styles.....45%
No. 2 Solid Collar.....35%
Half Patent:
Nos. 7, 8, 11 and 12.....70%
Nos. 13 to 14.....70%
Nos. 15 to 18.....75%
Nos. 19 to 22.....75%

Boxes, Axle—

Common and Concord, not turned lb., 4% @ 5%
Common and Concord, turned lb., 5% @ 6%
Half Patent.....lb., 9% @ 10%

Bait— Fishing—

Hendryx:
A Bait.....20%
B Bait.....25%
Competitor Bait.....25%

Balances— Sash—

Caldwell new list.....50%
Pullman.....50%

Spring—

Spring Balances.....50%
Chattillon's:
Light Spg. Balances.....50%
Straight Balances.....40%
Circular Balances.....50%
Large Dial.....30%

Barb Wire—See Wire, Barb.

Bars— Crow—

Steel Crowbars, 10 to 40 lb. per lb., 3% @ 4%

Towel—

No. 10 Ideal, Nickel Plate.....\$0.50

Beams, Scale—

Scale Beams.....40%
Chattillon's No. 1.....30%
Chattillon's No. 2.....40%

Beaters, Carpet—

Holt-Lyon Co.:
No. 12 Wire Coppered $\frac{1}{2}$ doz. \$0.80; Tinned.....\$0.85
No. 11 Wire Coppered $\frac{1}{2}$ doz. \$1.15; Tinned.....\$1.20
No. 10 Wire Tinned..... $\frac{1}{2}$ doz. \$1.50
Western W. G. Co.:
No. 1 Electric..... $\frac{1}{2}$ gro. \$7.00
No. 2 Buffalo..... $\frac{1}{2}$ gro. \$9.00
No. 3 Perfection Dust..... $\frac{1}{2}$ gro. \$8.00

Egg—

Holt-Lyon Co.:
Holt, per doz., No. 5, Jap'd, \$0.80; No. A, Jap'd, \$1.15; No. B, Jap'd, \$1.85; No. C, Jap'd, \$1.65.
Lyon, Jap'd, per doz., No. 2, \$1.35

Taplin Mfg. Co.: Improved Dover, per gro., No. 60, \$6.00; No. 75, \$6.50; No. 100, \$7.00; No. 102, Tin'd, \$8.50; No. 150, Hotel, \$15.00; No. 182, Hotel Tin'd, \$17.00; No. 200, Tumbler, \$8.50; No. 252, Tumbler Tin'd, \$9.50; No. 300, Mammoth, per doz., \$25.00.

Turner & Seymour Mfg. Co.: T. & S. Dover.....\$6.00

Western W. G. Co., $\frac{1}{2}$ gro., Buffalo, No. 2, \$8.00; Perfection, No. 3, \$9.00.
Wonder (R. M. Co.)..... $\frac{1}{2}$ gro. net, \$8.25

Bellows—

Blacksmith, Standard List.....45%
Split Leather.....45%
Grain Leather.....60%

Hand—

Inch.....\$ 7 8 9 10
Doz.....\$3.50 6.15 6.60 7.15 7.70

Molders—

Inch.....9 10 11 12 14
Doz.....\$3.00 9.00 10.50 12.50 14.50

Bells— Cow—

Ordinary Goods.....75%
High grade.....70%
Jersey.....75%
Texas Staf.....50%

Door—

Abbe's Gong.....40%
Barton Gong.....50%
Home R. & E. Mfg. Co.'s.....55%
Trip Gong.....50%
Yankee Gong.....40%

Polished, Brass—

White Metal.....50%
Nickel Plated.....40%

Door and Shutter—

Cast Iron Barrel, Japanned, Round Brass Knob:
Inch.....3 4 5 6 8
Per doz.....\$0.30 .35 .45 .60 .80
Cast Iron Spring Foot, Jap'd:
Inch.....5 6 8 10
Per doz.....\$1.20 1.50 2.25
Cast Iron Chain, Flat Japanned:
Inch.....6 8 10
Per doz.....\$1.00 1.40 1.65
Cast Iron Flat Shutter, Jap'd, Brass Knobs:
Inch.....6 8 10
Per doz.....\$0.75 .95 1.25
Wrought Barrel Jap'd.....\$0.80 @ 1.00
Barrel Bronzed.....\$0.40 @ 1.00
Spring.....70%
Shutter.....50%
Square Neck.....75%
Square.....70%
Ives' Patent Door.....50%

Miscellaneous—

Conc's Globe Hand Bells.....33%
Silver Chime.....30%

Farm Bells.....lb., 2% @ 3%

Church and School.....60%
Table Call Bells.....50%

Belting— Leather—

Extra Heavy, Short Lap.....60%
Regular Short Lap.....60%
Standard.....70%
Light Standard.....70%
Out Leather Lacing.....45%
Leather Lacing Slides, per sq. ft. 25%

Rubber—

Agricultural (Low Grade).....75%
Common Standard.....70%
Standard.....60%
Extra.....60%
High Grade.....50%

Bench Stops—

See Stops, Bench

Benders and Upsetters, Tire—

Detroit Perfected Tire Bender.....40%
Detroit Stoddard's Lightning Tire Upsetters, No. 1, \$4.25; No. 2, \$7.25; No. 3, \$10.50; No. 4, \$18.25; No. 5, \$20.50.
Green River Tire Benders and Upsetters.....30%

Bicycle Goods—

John S. Long's Son & Co.'s 1907 list:
Chain, Parts, Spokes.....50%
Tubes.....60%

Bits—

Auger, Gimlet, Bit Stock Drills, &c.—See Augers and Bits.

Blocks— Tackle—

Common Wooden.....75%
Harts St. Tackle Blocks.....50%
B. & L. B. Co.:
Boston Wood Snatch, 50%; Eclipse Steel, 75%; Hollow Steel, 50%
Star Wire Rope, 50%; Tarbox Metal Snatch, 50%; Tarbox New Style Steel, 50%
Lane's Patent Automatic Lock and Junior.....30%
Stowell's Novelty, Mal. Iron.....50%
Stowell's Loading.....50%
See also Machines, Hoisting.

Boards, Stove—

Paper and Wood Lined.....40%
Embossed.....50%

Boards, Wash—

See Washboards.

Bobs, Plumb—

Keuffel & Esser Co.....25%

Bolts—

Carriage, Machine, &c.—
Common Carriage (cut thread):
% X 6 and smaller.....70%
Larger and Longer.....60%
Phila. Eagle.....\$3.00 list May 21, '99

Bolt Ends.....65% @ 65%

Machine, % 4 and smaller.....70%
Machine, larger and longer.....60%

Door and Shutter—

Cast Iron Barrel, Japanned, Round Brass Knob:
Inch.....3 4 5 6 8
Per doz.....\$0.30 .35 .45 .60 .80
Cast Iron Spring Foot, Jap'd:
Inch.....5 6 8 10
Per doz.....\$1.20 1.50 2.25
Cast Iron Chain, Flat Japanned:
Inch.....6 8 10
Per doz.....\$1.00 1.40 1.65
Cast Iron Flat Shutter, Jap'd, Brass Knobs:
Inch.....6 8 10
Per doz.....\$0.75 .95 1.25
Wrought Barrel Jap'd.....\$0.80 @ 1.00
Barrel Bronzed.....\$0.40 @ 1.00
Spring.....70%
Shutter.....50%
Square Neck.....75%
Square.....70%
Ives' Patent Door.....50%

Plow and Stove—

Plow.....65%
Stove.....85%

Tire—

Common Iron.....80%
Norway Iron.....80%

American screw Company:

Norway Phila., list Oct. 16, '94.....80%
Eagle Phila., list Oct. 16, '94.....80%
Bay State, list Dec. 23, '99.....80%

Franklin Moore Co.:

Norway Phila., list Oct. 16, '94.....80%
Eagle Phila., list Oct. 16, '94.....80%
Eclipse, list Dec. 23, '99.....80%

Mount Carmel Bolt Co.:

Norway Phila., list Oct. 16, '94.....80%
Eagle Phila., list Oct. 16, '94.....80%
Mount Carmel, list Dec. 23, '99.....80%

Russell, Burdall & Ward Bolt & Nut Co.:

Empire, list Dec. 23, '99.....80%
Norway Phila., list Oct. 16, '94.....80%

Shelton Co.:

Tiger Brand, list Dec. 23, '99.....80%
Phila., Eagle, list Oct. 16, 1891.....80%

Upton Nut Co.:

Tire Bolts.....72%

Borers, Tap—

Borers Tap, Ring, with Handle:
Inch.....1 1/4 1 3/4 2
Per doz.....\$1.80 5.60 6.40 8.00
Inch.....2 1/4 3 1/4 4
Per doz.....\$5.65 11.50 11.50
Enterprise Mfg. Co., No. 1, \$1.25; No. 2, \$1.75; No. 3, \$2.50 each.....25%

Boxes, Mitre—

C. E. Jennings & Co.....30%
Langdon, New Langdon and Langdon Improved, 20410; Langdon Acme.....15%
Perfection.....40%
Seaver R. & L. Co.: Nos. 218 to 400, 30%; Nos. 50 and 60.....35%

Braces—

Common Ball, American, \$1.25 @ 1.50
Barber's.....50%
Fray's Genuine Sprockets.....60%
Fray's No. 79 to 120, 81 to 125, 207 to 411.....60%
C. E. Jennings & Co.....50%
Mayhew's Ratchet.....60%
Mayhew's Quick Action Hay Pat.....50%
Millers Falls Drill Braces.....25%
P. B. & W. Co., Peck's Pat. 60445
Stanley R. & L. Co.:
Stanley, 35%; Victor.....45%

Brackets—

Wrought Steel.....70%
Griffin's Pressed Steel.....75%
Griffin's Folding Brackets.....70%
Stowell's Cast Shelf, 75%; Sink.....50%
Western W. G. Co., Wire.....60%

Bright Wire Goods—

See Wire and Wire Goods.

Broilers—

Kilbourne Mfg. Co.....75%
Western W. G. Co.....80%
Wire Goods Co.....75%

Buckets, Galvanized—

M'fgr's list, price per gross.
Quart.....10 12 14
Water, Reg.....25.35 28.00 32.00
Water, Rev.....45.35 48.00 52.00
Fire, Rd. Btm.....32.00 34.65 38.65
Well.....37.35 41.35 45.35

Bucks, Saw—

Hooker..... $\frac{1}{2}$ gro. \$36.00

Bull Rings—See Rings, Bull

Butts— Brass—

Wrought, High List, Oct. 26, '06, \$45 @ 45.10%

Cast Brass, Tiebolt's.....40%

Cast Iron—

Fast Joint, Broad.....40%
Fast Joint, Narrow.....40%
Loose Joint.....70%
Loose Pin.....70%
Mayer's Hinges.....70%
Parliament Butts.....70%

Wrought Steel—

Reversible and Broad.....70%
Light Reversible, Light Narrow.....70%
Loose Joint, Narrow, Light Inside Blind, etc.....70%
Back Flaps, Table Chest.....65%

Cages, Bird—

Hendryx Brass: Series 3000, 3000, 1100, 10%; 1200, 25%; 200, 300, 600, 900.....40%

Extractors, Lemon Juice
—See Squeezers, Lemon.

Fasteners, Blind—
Zimmerman's 50¢10%
Wainwright's 40¢10%

Cord and Weight—
Ives 33%

Faucets—
Cork Lined 50¢10%
Metallic Key, Leather Lined 60¢10%
Red Cedar 40¢10%
Petroleum 70¢10%
B. & L. B. Co.:
Metal Key 60¢10%
Star 60¢10%
West Lock 60¢10%
John Sommer's Peerless Tin Key 50¢
John Sommer's Boss Tin Key 50¢
John Sommer's Victor Mtl. Key 50¢10%
John Sommer's Duplex Metal Key 60¢
John Sommer's Diamond Lock 60¢
John Sommer's I. K. L. Cork Lined 50¢
John Sommer's Reliable Cork Lined 50¢10%

John Sommer's Chicago Cork Lined 50%
John Sommer's O. K. Cork Lined 50%
John Sommer's No Brand, Cedar 50%
John Sommer's Perfection, Cedar 40%
McKenna, Brass:
Burglar Proof, N. P. 25%
Improved, 1/2 and 1/4 inch 25%
Self Measuring:
Enterprise, 1/2 doz. 13¢.00 40¢10%
Lane's, 1/2 doz. 13¢.00 40¢10%
National Measuring, 1/2 doz. 13¢.00 40¢10%

Fellose Plates—
See Plates, Fellose.

Files, Domestic—
List Nov. 1, 1899.
Best Brands 70¢10%
Standard Brands 75¢10%
Lower Grade 75¢10%
Imported—
Stubs' Tapers, Stubs' list, July 24, '97 33 1-8@40%

Fixtures, Fire Door—
Richards Mfg. Co.:
Universal, No. 103; Special, No. 104 33.75
Fusible Links, No. 96 30%
Expansion Bolts, No. 107 60¢10%

Grindstone—
Net Prices:
Inch 15 17 19 21
Per doz. \$3.85 3.75 4.25 4.75
P. S. & W. Co. 30¢10%
Reading Hardware Co. 60%
Stowell's Giant Grindstone Hanger 1/2 doz. 65¢
Stowell's Grindstone Fixtures, Extra Heavy, 40¢10%; Light 50%

Fodder Squeezers—
See Compressors.

Forks—
NOTE.—Manufacturers are selling from the list of September 1, 1904, but many fobbers are still using list of August 1, 1899, or selling at net prices.
Iowa Dig-Ezy Potato 60¢10%
Victor, Hay 60¢15¢25¢
Victor, Manure 60¢
Victor, Header 60¢
Champion, Hay 60¢
Champion, Header 60¢
Champion, Manure 60¢15¢25¢
Columbia, Hay 60¢
Columbia, Manure 60¢15¢
Columbia, Spading 60¢15¢
Hawkeye Wood Barley 40¢
W. & C. Potato Digger 60¢10%
Acme Hay 60¢
Acme Manure, 4 time 60¢10¢45¢
Dakota Header 60¢20¢
Jackson Steel Barley 60¢20¢
Kansas Header 60¢
W. & C. Favorite Wood Barley 40¢
Plated—See Spoons.

Frames—Saw—
White, 8'x7' Bar, per doz. 75¢80¢
Red, 8'x7' Bar, per doz. 1.00¢1.25
Red, Dbl. Brace, per doz. 1.40¢1.50

Freezers, Ice Cream—
Qt. 1 2 3 4 6
Each \$1.30 1.60 1.90 2.20 2.50

Fruit and Jelly Presses—
See Presses, Fruit and Jelly.

Fry Pans—See Pans, Fry.

Fuse— Per 1000 Feet.
Hemp 32.75
Cotton 3.20
Waterproof Spl. Taped 3.65
Waterproof Dbl. Taped 4.40
Waterproof Tpl. Taped 6.15

Gates, Molasses and Oil—
Stebbins' Pattern 60¢10%

Gauges—
Marking, Mortise, &c. 50¢50¢10%
Chapin-Stephens Co.:
Marking, Mortise, &c. 50¢50¢10%
Dixton's Marking, Mortise, &c. 67%
Stanley R. & L. Co.'s Butt and Rabbit Gauge 30%
Marking and Mortise 35%
Wire, Brown & Sharpe's 33%
Wire, Morse's 25%
Wire, P. S. & W. Co. 20%

Glimets—Single Cut—
Numbered assortments, per gro.
Nail, Metal, No. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000

Gauges—
Marking, Mortise, &c. 50¢50¢10%
Chapin-Stephens Co.:
Marking, Mortise, &c. 50¢50¢10%
Dixton's Marking, Mortise, &c. 67%
Stanley R. & L. Co.'s Butt and Rabbit Gauge 30%
Marking and Mortise 35%
Wire, Brown & Sharpe's 33%
Wire, Morse's 25%
Wire, P. S. & W. Co. 20%

Glimets—Single Cut—
Numbered assortments, per gro.
Nail, Metal, No. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963

Hitchers, Stall—
Covett Mfg. Co., Stall Hitchers. 30&2%
Hods— Coal—
M'Gr's list, price per gross.
Inch.....16 17 18
Galv. Open.....\$35 \$39 \$42 \$46
Jap. Open.....26 28 31 35
Galv. Funnel.....43 48 52 56
Jap. Funnel.....33 36 39 43

Masons' Etc.—
Cleveland Wire Spring Co.:
Steel Brick, No. 162.....each \$1.05
Steel Mortar, No. 158.....each \$1.35

Hoes— Eye—
Scott and Oval Pattern.....
60&100 60&100 100
Grub, list Feb. 23, 1899.....
70&100 75&100 100
D. & H. Scovill.....30%

Handled—
NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.
Crouk's Weeding, No. 1, \$2.75; No. 2, \$2.50
Star Double Bit.....\$3.20
Ft. Madison Cotton Hoe.....70&100 100
Ft. Madison Crescent Cultivator Hoe.....70&100 100
Ft. Madison Mattock Hoes.....70&100 100
Regular Weight.....doz. 60%
Junior Size.....doz. \$4.00
Ft. Madison Sprouting Hoe.....doz. 60%
Ft. Madison Dixie Tobacco Hoe.....70&100 100
Kretzinger's Cut Easy.....doz. 100
Warren Hoe.....45&100 100
W. & C. Ivanhoe.....75&100 100
B. B. 6 in. Cultivator Hoe.....\$3.15
B. B. 6 in. Hoe.....doz. 60%
Acme Weeding.....doz. \$4.00
W. & C. Luning Shrub Hoe, doz. \$4.00

Hoisting Apparatus—
See Machines, Hoisting.
Holders— Bit—
Angular, ½ doz. \$24.00.....45&100
Door—
Bardsley's, Iron, 40%; Brass and Bronze.....33%
Empire.....50%
Pullman.....35%
Superior.....33%
File and Tool—
Nicholson File Holders and File Handles.....33&40%
Fruit Jar—
Triumph Fruit Jar Holder, ½ gross, \$10.00; ½ doz. \$1.25
Trace and Rein—
Fernald Double Trace Holder, ½ doz. pairs.....\$1.25
Dash Rein Holder, ½ doz. pairs.....\$1.25
Hones—Razor—
Pike Mfg. Co., Belgian, German and Swat.....50%
Hooks—Cast Iron—
Bird Cage, Reading.....40%
Clothes Line, Reading List.....70%
Clothes Line, Stowell's.....45&100 100
Coat and Hat, Reading.....45&100 100
Coat and Hat, Stowell's.....70%
Coat and Hat, Wrightsville.....60%
Harness, Reading List.....40%
Harness, Stowell's.....60%
School House, Stowell's.....70%
Wire—
Belt.....60%
Wire C. & H. Hooks.....75&100 100
Columbian Hdw. Co., Gem.....70&100 100
Parker Wire Goods Co., King.....70&100 100
Western W. G. Co. Molding.....75%
Wire Goods Co.:
Acme, 60&100%; Chief, 70%; Crown, 75%; Czar, 65%; V. Brace, 75%; Czar Harness, 50&100%
Wrought Iron—
Box, 6 in., per doz. \$1.00; 8 in., \$1.25; 10 in., \$2.50.
Cotton.....doz. \$1.05 100
Wrought Staples, Hooks, etc.—
See Wrought Goods

Miscellaneous—
Hooks, Bench, see Stops, Bench.
Bush, Light, doz. \$1.75; Medium, \$3.35; Heavy, \$6.25
Grass, best, all sizes, per doz. \$1.60
Grass, common grades, all sizes, 100 doz.....\$1.30
Whimtree.....lb. 5% 100
Hooks and Eyes:
Brass.....60&100 100
Malleable Iron.....70&100 100
Covett Mfg. Co. Gate and Scuttle Hooks.....40%
Ft. Madison Cut-Easy Corn Hooks.....doz. \$3.25 net
Turner & Stanton Co. Cup and Shoulder.....30&100 100
Bench L. Hooks—See Bench Stops.
Corn Hooks—See Knives, Corn.

Horse Nails—
See Nails, Horse.
Horseshoes—
See Shoes, Horses.
Hose, Rubber—
Garden Hose, ¾-inch.
Competition.....ft. 5 @ 6
3-ply Guaranteed, ft. 8 @ 9
4-ply Guaranteed, ft. 10 @ 11
Cotton Garden, ¾-in., coupled.
Low Grade.....ft. 8 @ 9
Only Quality.....ft. 10 @ 11

Irons— Sad—
From 1 to 10.....lb. 3 @ 4
B. B. Sad Irons.....lb. 3 @ 4
Mrs. Potts, cents per set:
Nos. 80 55 40 35
Jap'd Tops.....80 77 60 55
Tin'd Tops.....85 82 65 58
New England Pressing, lb. 3% @ 4
Pinking—
Pinking Irons.....doz. 60%

Irons, Soldering
See Copiers.
Jacks, Wagon—
Covett Mfg. Co.:
Auto Screw.....30&2% Steel, 45%
Lockport.....50%
Lane's Steel.....30&100 100
Richards' Tiger Steel, No. 130.....50&100 100
Smith & Hemenway Co.'s.....25%

Kettles—
Brass, Spun, Plain.....20&25%
Enameled and Cast Iron—See Ware, Hollow.
Knives—
Butcher, Kitchen, &c.—
Foster Bros. Butcher, &c.....30%
Wilkinson Shear & Cutlery Co.....60%
Corn—
Wilkinson Shear & Cutlery Co.:
Wilcutt Brand Knives and Hooks, 60%
Wilkinson Acme, ½ doz. \$2.65;
Dent, \$2.75; Adj. Serrated, \$2.20;
Serrated, \$2.10; Yankee No. 1, \$1.50;
Yankee No. 2, \$1.15.

Drawing—
Standard List.....75&100 100
C. E. Jennings & Co., Nos. 45, 46, 60%
Jennings & Griffin, Nos. 41, 42.....75%
Swan's.....60% 100
Watrous.....16%
L. & I. J. White.....20&25 100

Hay and Straw—
Serrated Edge, per doz. \$5.50 @ 5.75
Iwan's Sickle Edge.....doz. \$5.50
Iwan's Serrated.....doz. \$12.00

Mincing—
Buffalo.....½ gro. \$13.00

Miscellaneous—
Farriers.....doz. \$3.00 100
Wostenholm's.....doz. \$3.00 100

Knobs—
Base, 2½-inch, Birch, or Maple, Rubber Tip.....gro. \$1.25 @ \$1.40
Carriage, Jap., all sizes.....gro. 100 100
Door, Mineral.....doz. 65 100 100
Door, Por. Jap'd.....doz. 70 100 100
Door, Por. Nickel.....doz. 80 100 100
Bardsley's Wood Door, Shutters, &c. 15%

Lacing, Leather—
See Belting, Leather.
Ladders, Store, &c.—
Allith Mfg. Co., Reliable.....50%
Lane's Store.....25%
Myers' Noisette Store Ladders.....25%
Richards Mfg. Co.:
Improved Noiseless, No. 112.....50%
Climax Shelf, No. 113.....50%
Trolley, No. 109.....50%
Ladies, Melting—
L. & G. Mfg. Co. (low list).....25%
P. S. & W.....40&100 100
Reading.....60%

Lanterns—Tubular—
Regular Tubular, No. 0.....doz. \$1.25 @ \$1.50
Lift Tubular, No. 0.....doz. \$1.75 @ \$2.00
Hinge Tubular, No. 0.....doz. \$1.75 @ \$2.00
Other Styles.....40 @ 100 100

Bull's Eye Police—
No. 1, 2½-inch.....\$2.75 @ \$3.00
No. 2, 3-inch.....\$3.00 @ \$3.25

Lasts and Stands, Shoe—
Stowell's Atlas, Malleable Iron.....50%
Stowell's Badger, Cast Iron.....50%

Latches—Thumb—
Roggin's Latches, with screw.....doz. 35 @ 40

Door—
Allith Mfg. Co., Automatic, No. 400, ½ doz. \$4.00
Cronk & Carrier Mfg. Co., No. 101, ½ doz. \$2.30
Cronk & Carrier Mfg. Co., Latch, Haap and Staples.....50%
Richards' Bull Dog, Heavy, No. 125.....50&100 100
Richards' Trump, No. 127.....\$1.20
Stowell's Steel.....50%

Loaders, Cattle—
Small.....doz. 80¢; large, 60¢
Covett Mfg. Co.:
Cotton, 45%; Hemp, 45%; Jute, 35%; Sisal, 20%
Lifters, Transom—
R. & E.....10%

Lines—
Wire Clothes, Nos. 18 19 20
100 feet.....\$2.25 2.00 1.75
75 feet.....\$1.75 1.55 1.10
Anniston Waterproof Clothes, 50 ft., ½ gro. \$3.00; Gilt Edge, \$3.00; Air Line, \$2.00; Acme, \$1.50; Alabama, \$17.00; Empire, \$16.00; Advance, \$14.00; Eclipse, \$13.50; Chicago, \$11.50; Standard, \$10.50; Columbia, \$9.50; Allston, \$13.50; Calhoun, \$12.00.
Samson Cordage Works:
Solid Braided Chalk, Nos. 0 to 3, 40%
Solid Braided Mammot.....30%
Silver Lake Braided Chalk, No. 0, \$6.00; No. 1, \$6.50; No. 2, \$7.00; No. 3, \$7.50.
Masons' Lines, Shade Cord, &c.:
White Cotton, No. 34, \$1.50; No. 4, \$2.00; No. 4½, \$1.50; Colors, No. 34, \$1.75; No. 4, \$2.25; No. 4½, \$2.75;
Linen, No. 34, \$2.50; No. 4, \$3.50;
No. 4½, \$4.50.
Tent and Awning Lines: No. 5, White Cotton, \$7.50; Drab Cotton, \$8.50.
Clothes Lines, White Cotton: 20 ft., \$2.75; 30 ft., \$3.25; 40 ft., \$3.75; 50 ft., \$4.00; 60 ft., \$4.25; 70 ft., \$4.75; 100 ft., \$5.25.
Locks— Cabinet—
Cabinet Locks.....33% 100

Door Locks, Latches, &c.—
NOTE.—Net prices are very often made on these goods.
Reading Hardware Co.....40%
R. & E. Mfg. Co.....10%
Elevator—
Stowell's.....50%
Padlocks—
R. & E. Mfg. Co. Wrought Steel and Brass.....75&100 100
Sash, &c.—
Ives' Patent:
Bronze and Brass, 60%; Crescent, 40&20%; Iron, 60%; Window Ventilating, 55%; Robinson Pat Ventilating Sash Lock, 33%; Wrought Bronze and Brass, 55%; Wrought Steel, 55%
Pullman Patent Ventilating Lock.....35%
Reading.....40%

Machines—Boring—
Com. Up'r't, without Augers.....\$2.00 @ 2.25
Com. Ang'l'r, without Augers.....\$2.25 @ 2.50
Swan's Improved.....40&100 100
Jennings' Nos. 1 and 4.....33%
Miller's Falls.....5%
Snell's, Upright, \$2.65; Angular, \$2.90

Corking—
Reisinger Invinible Hand Power.....doz. \$48.00

Fence—
Williams' Fence Machines.....each, \$5.50

Hoisting—
Moore's Anti-Friction Chain Hoist, 30%
Moore's Hand Hoist, with Lock Brake.....20%
Moore's Cyclone High Speed Chain Hoist.....25%

Ice Cutting—
Chandler's Washing.....12%
Boss Washing Machine Co.: Per doz.
Boss No. 1.....\$57.00
Boss Rotary.....\$57.00
Champion Rotary Banner No. 1.....\$57.00
Standard Champion No. 1.....\$50.00
Standard Perfection.....\$27.00
Cincinnati Square Western.....\$35.00
Uneda American, Round.....\$35.00

Mallets—
Hickory.....45&100 100
Lignumvita.....45&100 100
Timber's Hickory and Applewood.....doz. 45&100 100

Mangers, Stable—
Sweet Iron Works.....50%
Mashers, Vegetable—
Western, W. G. Co. Potato.....60&100 100

Mats, Door—
Elastic Steel (W. G. Co.), new list, 50%
Keystone Wire Matting Co.:
Keystone.....50%
Ideal.....50%

Mattocks—
See Picks and Mattocks.
Milk Cans—See Cans, Milk.
Mills, Coffee, &c.—
Enterprise Mfg. Co.....20&25 100
National list, Jan. 1, 1902.....40&100 100
Parker's Columbia & Victoria.....50&100 100
Parker's Box and Slide.....50&100 100
Swift, Lane Bros. Co.....30%

Motors Water—
Divine's Red Devil.....30%

Mowers, Lawn—
NOTE.—Net prices are generally quoted
Chapeau.....all sizes, \$1.85 @ \$2.00
Cheap.....all sizes, \$2.00 @ \$2.50
Better Grade.....all sizes, \$2.50 @ \$4.50
12 14 16 18-in.
High Grade.....\$4.50 4.75 5.00 5.25
Continental.....60&100 100
Great American.....70%
Great American Ball B'r'g, new list, 70%
Quaker City.....70%
Pennsylvania, Jr. Ball Bearing.....60%
Pennsylvania Golf.....50%
Pennsylvania Horse.....33&100 100
Pennsylvania Pony.....40&100 100
Granite State:
Style A, Low Wheel.....70&100 100
Style B, Low Wheel.....70&100 100
Style C, High Wheel, spec. disc't., 70&100 100
Style D, High Wheel, spec. disc't., 70%
Philadelphia:
Styles M., S. O. K., T.....70&100 100
Style A, All Steel.....60&100 100
Style B, High Wheel.....70&100 100
Drexel and Gold Coin, special list, 40%
Horse.....40&100 100
Pony.....40&100 100
36-in. Horse.....30&100 100
Eagle Horse.....30&100 100
L. X. L. Horse.....50%

Nails—
Wire Nails and Brads, Miscellaneous.....87% @ 87% 100
Cut and Wire. See Trade Report.
Hungarian, Finishing, Upholsterers' &c. See Tacks.
Horse—
Anchor Nos. 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100
Chaplain.....23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100
Coleman.....13 12 11 10 9 8 7 6 5 4 3 2 1
New Haven.....23 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1
Livingston.....19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1
Western.....doz. 8 1/2 @ 9
Jobbers' Special Brands.....per lb. 9 @ 10 100

Picture—
1/4 3/4 1 1 1/4 1 1/2 1 3/4 2 2 1/4 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100
Brass H'd. 15 25 35 50 70 90 110 130 150 170 190 210 230 250 270 290 310 330 350 370 390 410 430 450 470 490 510 530 550 570 590 610 630 650 670 690 710 730 750 770 790 810 830 850 870 890 910 930 950 970 990 1000
Por. Head.....1.10 1.15 1.20 1.25 1.30 1.35 1.40 1.45 1.50 1.55 1.60 1.65 1.70 1.75 1.80 1.85 1.90 1.95 2.00 2.05 2.10 2.15 2.20 2.25 2.30 2.35 2.40 2.45 2.50 2.55 2.60 2.65 2.70 2.75 2.80 2.85 2.90 2.95 3.00 3.05 3.10 3.15 3.20 3.25 3.30 3.35 3.40 3.45 3.50 3.55 3.60 3.65 3.70 3.75 3.80 3.85 3.90 3.95 4.00 4.05 4.10 4.15 4.20 4.25 4.30 4.35 4.40 4.45 4.50 4.55 4.60 4.65 4.70 4.75 4.80 4.85 4.90 4.95 5.00 5.05 5.10 5.15 5.20 5.25 5.30 5.35 5.40 5.45 5.50 5.55 5.60 5.65 5.70 5.75 5.80 5.85 5.90 5.95 6.00 6.05 6.10 6.15 6.20 6.25 6.30 6.35 6.40 6.45 6.50 6.55 6.60 6.65 6.70 6.75 6.80 6.85 6.90 6.95 7.00 7.05 7.10 7.15 7.20 7.25 7.30 7.35 7.40 7.45 7.50 7.55 7.60 7.65 7.70 7.75 7.80 7.85 7.90 7.95 8.00 8.05 8.10 8.15 8.20 8.25 8.30 8.35 8.40 8.45 8.50 8.55 8.60 8.65 8.70 8.75 8.80 8.85 8.90 8.95 9.00 9.05 9.10 9.15 9.20 9.25 9.30 9.35 9.40 9.45 9.50 9.55 9.60 9.65 9.70 9.75 9.80 9.85 9.90 9.95 10.00
Nippers—
See Picks and Nippers.
Nuts—
Cold Punched: Off list.
Square, Blank or Tapped, 1.80¢
Hexagon, Blank or Tapped, 1.10¢
Square, B'k. C. T. & R., 5.10¢
Hexagon, B'k. C. T. & R. 5.70¢

Hot Pressed:
Square, Blank.....5.00¢
Hexagon, Blank.....5.40¢
Square, Tapped.....4.70¢
Hexagon, Tapped.....5.10¢

Oakum—
Best.....lb. 6 1/2¢
U. S. Navy.....lb. 6¢
Navy.....lb. 5¢
Plumbers' Spun Oakum.....5¢
In carload lots 1/4 lb. off, 1.0. b.
New York.

Oil Tanks—See Tanks, Oil.
Oilers—
Brass and Copper.....50&100 100
Tin or Steel.....65&100 100
Zinc.....65&100 100
Chase or Paragon:
Brass and Copper.....50&100 100
Tin or Steel.....65&100 100
Zinc.....65&100 100
Malleable, Hammers' Improved, Nos. 1, 2, 3, 50%
American Tube & Stamping Co.:
Spring Bottom Cans.....70&100 100
Railroad Oilers, &c.....60&100 100

Openers—Can—Per doz.
Sprague, Iron Handle.....30¢ 35¢
Sprague, Wood Handle.....35¢ 40¢
Sardine Scissors.....\$1.75 @ \$3.00
Vim Tin Shear and an Opener.....doz. \$7.50
Yankee Can and Bottle Opener, ½ doz., net.....\$0.75

Egg—
Nickel Plate, ½ doz., \$2.00; Silver Plate, \$4.00.

Packing—
Asbestos Packing, Wick and Rope.....20 @ 25¢
Rubber—
(Fair quality goods.)
Sheet, C. I.....11 @ 12¢
Sheet, C. O. S.....11 @ 12¢
Sheet, C. B. S.....12 @ 13¢
Sheet, Pure Gum.....10 @ 15¢
Sheet, Red.....10 @ 15¢
Jenkins' 96, ½ lb., 80¢.....25%

Miscellaneous—
American Packing.....lb. 7 @ 10
Cotton Packing.....lb. 16 @ 25
Italian Packing.....lb. 9 @ 12 1/2
Jute.....lb. 4 @ 4 1/2
Russia Packing.....lb. 8 @ 11

Pails, Creamery—
R. M. Co., with gauges, ½ doz., No. 1, \$2.25; No. 2, \$4.50.
Pails, Water, Well, &c.—
See Buckets.
Pans—Dripping—
Standard list.....70&100 100
Edwards, Royal Blue.....65&75 100
Fry—
Common Lipped:
Nos. 1 2 3 4 5
Per doz. \$0.75 0.80 0.90 1.10 1.30
Refrigerator, Galva.—
Inch.....12 14 16 18
Per doz.....\$1.75 2.25 2.80 3.15
Roasting and Baking—
Regal, R. M. Co., ½ doz., Nos. 5, \$1.50; 10, \$2.25; 20, \$3.75; 30, \$6.25.
Bavory, ½ doz., net, Nos. 250, \$9.00; 400, \$15.00.
Simpler, ½ gro.:
No. 40 50 60 140 180 100
\$3.00 35.00 42.00 31.00 30.00 48.00
Paper—Building Paper—
Asbestos.....lb.
Roll Board or Building Felt, 6 to 30 lb., per 100 sq. ft. 3.3¢ to 5¢
Roll Board or Building Felt, 3-32 and ¼ in., 45 to 60 lb., per 100 sq. ft.....6¢
Mill Board, Sheet, 40 x 40 in., 1-32 to ¼ in.....3¢ @ 5¢
Per roll
Rosin Sized Sheathing: 500 sq. ft. Light weight, 25 lbs. to roll 40¢ @ 50¢
Medium weight, 30 lbs. to roll 80¢ @ 55¢
Heavy weight, 40 lbs. to roll 65¢ @ 70¢
Black Water Proof Sheathing, 500 sq. ft., 1 ply, 65¢; 2 ply, 85¢; 3 ply, \$1.10; 4 ply, \$1.25.
Deafening Felt, 9, 6 and ¼ sq. ft. to lb. ton.....\$50.00
Red Rope Roofing, 250 sq. ft. per roll.....\$1.75
Tarred Paper—
1 ply (roll 400 sq. ft.), ton.....\$31.00 @ \$35.00
2 ply, roll 108 sq. ft.....57¢
3 ply, roll 108 sq. ft.....80¢
Slater's Felt (roll 500 sq. ft.) 76¢
Sand and Emery—
Fint Paper and Cloth, 50¢ @ 10¢
Garnet Paper and Cloth.....25%
Emery Paper and Cloth.....50¢ @ 100%
Papers—Apple—
Advance.....doz. \$4.00
Haldwin.....doz. \$4.00
Bonzanza Improved.....each \$6.50
Dandy.....doz. \$4.00
Eureka Improved.....each \$7.50
Family Bay State.....doz. \$3.00
Improved Bay State.....doz. \$3.00
Little Star.....doz. \$5.00
New Lightnings.....doz. \$7.00
Reading.....doz. \$3.25
Rocking Table.....doz. \$5.00
Turn Table.....doz. \$5.00
White Mountain.....doz. \$5.00

Potato—
Saratoga per doz. \$7.50
White Mountain..... per doz. \$6.00

Picks and Mattocks—
List, Feb. 23, 1899..... 70¢ to 10¢ 75¢
Cronk's Handled Garden Mattock,
per doz., No. 2, \$2.00; No. 3, \$6.40.

Pinking Irons—
See Irons, Pinking.

Pincers—
Vaughan & Bushnell, per doz., 10
in., \$5.00; 12 in., \$5.50; 14 in., \$6.00.
Carpenters' Claw—
Vaughan & Bushnell, per doz., 6
in., \$2.00; 8 in., \$2.75; 10 in., \$3.00.

Pins, Escutcheon—
Brass 50¢ to 10¢ 60¢
Iron, list Nov. 11, '85 60¢ to 10¢ 60¢

Pipe, Cast Iron Soil—
Carload lots.
Standard, 2-6 in. 50¢ to 10¢ 65¢
Extra Heavy, 2-6 in. 65¢ to 10¢
Fittings 70¢ to 10¢ 70¢ 65¢

Pipe, Merchant—
Consumers, Carloads.
Steel. Iron.
Blk. Galv. Blk. Galv.
1/4 & 1/2 in. 60 50 59 65 43 65
3/4 in. 68 54 61 65 43 65
1 in. 70 58 63 65 43 65
1 1/2 in. 74 64 68 65 43 65
2 to 6 in. 79 64 68 65 43 65
7 to 12 in. 84 64 68 65 43 65

Pipe, Vitrified Sewer—
Carload lots.
Standard Pipe and Fittings, 3
to 24 in., f.o.b. factory:
First-class 81¢
Second-class 87¢
NOTE.—Market irregular.

Pipe, Stove—
Per 100 joints.
C. L. L. C. L.
Edwards' Nested:
5 in., Standard Blue..... 62 75 72 25
6 in., Standard Blue..... 67 75 77 25
7 in., Standard Blue..... 71 75 81 25
8 in., Royal Blue..... 70 80 80 25
9 in., Royal Blue..... 75 80 80 25
10 in., Royal Blue..... 80 80 80 25

Planes and Plane Irons—
Wood Planes—
Bench, first qual. 30¢ to 40¢ 10¢
Bench, second qual. 40¢ to 40¢ 10¢
Molding 25¢ to 25¢ 10¢
Bailey's (Stanley R. & L. Co.) 35¢ to 25¢
Chapin-Stephens Co.:
Bench, First Quality..... 30¢
Bench, Second Quality..... 40¢
Molding and Miscellaneous..... 25¢
Toy and German..... 30¢
Union 60¢

Plane Irons—
Bailey's (Stanley R. & L. Co.)..... 35¢
Chapin's Iron Planes..... 50¢ to 10¢
Miscellaneous Planes (Stanley R. & L. Co.)..... 30¢ to 5¢
Union 60¢

Plane Irons—
Wood Bench Plane Irons, list
Dec. 12, '96..... 25¢
Buck Bros..... 25¢
Chapin-Stephens Co..... 25¢
Stanley R. & L. Co..... 35¢
Union 50¢
L. & J. J. White..... 25¢ to 25¢

Planters, Corn, Hand—
Kohler's Eclipse..... per doz. \$2.00

Plates—
Felloe 10¢ to 14¢
Self-Sealing Pie Plates (R. M.
Co.) per doz. \$2.00..... 50¢

Pliers and Nippers—
Button Pliers..... 75¢ to 75¢ 10¢
Gas Burner, per doz., 6 in., \$1.25
@ \$1.30; 6 in., \$1.45 @ \$1.50.
Gas Pipe, 7 8 10 12 in.
\$2.00 \$2.25 \$2.75 \$3.50

Acme Nippers—
Cronk & Carrier Mfg. Co.:
American Button..... 50¢
Improved Button..... 75¢ to 10¢
Cronk's 50¢
No. 50 Linemen's..... 50¢
Stub's Pattern..... 35¢
Combination and others..... 35¢
Heller's Farmers' Nippers, Pincers
and Tools..... 60¢ to 10¢ 65¢
The Nettleton Mfg. Co. Reversible
Cutting Nippers..... 40¢
P. S. & W. Tinnars' Cutting Nip-
pers 50¢
Wm. Schollhorn Co.:
Bernard, 3 1/2 in., Elm City, 3 1/2 in.:
Paragon, 50¢; Lodi, 50¢.
Swedish Side, End and Diagonal Cut-
ting Pliers..... 50¢
Utica Drop Forge & Tool Co.:
Pliers and Nippers, all kinds..... 40¢
Vaughan & Bushnell Mfg. Co.:
Gas Burner, per doz., 5 in., \$2.50;
6 in., \$3.00.
Gas, per doz., 7 in., \$3.50; 8 in.,
\$3.75; 10 in., \$4.50.
Nippers, Horsehoes' Cutting, 40¢;
Hoof Faring..... 40¢

Plumbs and Levels—
Chapin-Stephens Co.:
Plumbs and Levels..... 30¢ to 30¢ 10¢
Chapin's Imp. Brass Cor. (40¢ to 40¢ 10¢)
Pocket Levels..... 30¢ to 30¢ 10¢
Extension Sights..... 30¢ to 30¢ 10¢
Machinists' Levels..... 40¢ to 40¢ 10¢
Disston's Plumbs and Levels..... 60¢ to 10¢
Disston's Pocket Levels..... 60¢ to 10¢
C. W. Jennings & Co.'s Iron, Adjust-
able 40¢ to 40¢ 10¢
Stanley R. & L. Co..... 40¢
Stanley's Duplex..... 30¢
Woods' Extension..... 35¢

Poachers, Egg—
Buffalo Steam Egg Poachers, per doz.,
No. 1, \$6.00; No. 2, \$9.00; No. 3,
\$9.00; No. 4, \$12.00..... 50¢

Points, Glaziers—
Bulk and 1-lb. papers..... 10¢ to 10¢
1/4-lb. papers..... 10¢ to 10¢
1/2-lb. papers..... 10¢ to 10¢

Pokes, Animal—
Ft. Madison Hawkeye..... per doz. \$3.25
Ft. Madison Western..... per doz. \$4.00

Police Goods—
Manufacturers' Lights..... 25¢ to 25¢ 10¢
Tower's 25¢

Polish—Metal, Etc—
Glasbrite, No. 2, 5 lb. can (powder),
each, \$1.25; per doz. \$12.00; No. 2, 10 lb.
can (cake), each, \$2.50; per doz. \$24.00.
Prestoline Liquid, No. 1 (1/2 pt.), per
doz., \$3.00; No. 2 (1 qt.), \$9.00. 40¢
Prestoline Paste..... 40¢
George William Hoffman:
U. S. Metal Polish Paste, 3 oz.
boxes, per doz. \$0.4; per gro. \$4.80;
1 lb. boxes, per doz. \$1.25; 1 lb.
boxes, per doz. \$2.25.
U. S. Liquid, 8 oz. cans, per doz.,
\$1.25.
Barkeepers' Friend Metal Polish, per
doz., \$1.75.

Stove—
Black Eagle Benzine Paste, 5 lb. cans,
per 10 lb. 4
Black Eagle, Liquid, 1/4 pt. cans,
per doz. 75¢
Black Jack Paste, 1/4 lb. cans, per gr. \$9.00
Black Kid Paste, 5 lb. cans, each, \$0.55
Ladd's Black Beauty Liquid, per
100 tins..... 66.75
Joseph Dixon's, per gr. \$5.75..... 10¢
Dixon's Plumbago..... 10¢
Fireside per gr. \$2.50
Gem, per gr. \$1.50..... 10¢
Japanese per gr. \$3.50
Jet Black..... per gr. \$3.50
Peerless Iron Enamel, 10 oz. cans,
per doz. \$1.50

Wynn's Black Silk:
Paste, cans, per doz., 5 oz., \$0.75;
1/4 lb., \$1.00; 1 lb., \$1.75
Paste, per 5 lb. can..... \$0.70
Liquid, cans, per doz., 6 oz., \$0.75;
1/2 pt., \$1.00; 1 pt., \$1.75
Steel Range Enamel, per doz., 1/4 pt.,
\$1.00; 1/2 pt., \$1.25.

Poppers, Corn—
1 qt. Square, doz. \$0.80; gro. \$8.00
1 qt. Round, doz. \$0.90; gro. \$9.00
1 1/2 qt. Square, doz. \$1.00; gro. \$10.00
2 qt. Square, doz. \$1.20; gro. \$12.00

**Post Hole and Tree Au-
gers and Diggers—**
See also Diggers, Post Hole, &c.

Posts, Steel—
Steel Fence Posts, each, 5 ft., 42¢;
6 ft., 46¢; 6 1/2 ft., 48¢.
Steel Hitching Posts..... each \$1.30

Potato Parers—
See Parers, Potato.

Pots, Glue—
Enamelled 35¢ to 10¢
Tinned 30¢ to 10¢

Powder—
In Containers:
Duck, 1 lb..... each 45¢
Fine Sporting, 1 lb..... each 75¢
Rifle, 1/2 lb..... each 15¢
Rifle, 1 lb..... each 25¢
In Kegs:
12 1/2 lb. kegs..... \$3.50
25 lb. kegs..... \$4.50

King's Semi-Smokeless:
Keg (25 lb. bulk)..... 65.50
Half Keg (12 1/2 lb. bulk)..... 33.50
Quarter Keg (6 1/4 lb. bulk)..... 17.50
Case 24 (1 lb. cans bulk)..... 33.50
Half case (1 lb. cans bulk)..... 17.50
King's Smokeless: Shot Gun, Rifle,
Keg (25 lb. bulk)..... 12.00
Half Keg (12 1/2 lb. bulk)..... 6.00
Quarter Keg (6 1/4 lb. bulk)..... 3.00
Case 24 (1 lb. cans bulk)..... 14.00
Half case (1 lb. cans bulk)..... 7.00
Robin Hood Sm'less Shot Gun, 50¢ to 20¢

Presses—
Fruit and Jelly
Enterprise Mfg. Co..... 20¢ to 25¢

Seal Presses—
Morrill's No. 1, per doz., \$20.00..... 50¢

Pruning Hooks and Shears
See Shears.

Pullers, Nail—
Cyclops 50¢
Miller's Falls, No. 3, per doz., \$12.00
Morrill's No. 1, Nail Puller, per doz.
\$20.00..... 50¢
Pearson No. 1, Cyclone Spike Puller,
each \$30.00..... 50¢
Scranton, Case Lots:
No. 2B (large)..... 35.50
No. 3B (small)..... 35.00
Smith & Hemenway Co.:
Diamond B, case lots, per doz., Large,
\$8.00; Small, \$7.50.
Giant No. 1, per doz., \$18; No. 1 1/2,
\$18.50; No. 3, \$15..... 35¢
Staple Pullers, Utica and Davi-
son 50¢
Parrot Tack and Stub Puller, per doz.,
75¢; per gro., \$9.00

Pulleys, Single Wheel—
Inch 1/4 1/2 3/4 1 1 1/2 2 3
Avening or Tackle,
doz., \$0.30 15 60 1.05
Hay Fork, Swivel or Solid Eye,
doz., 1 in., \$1.25; 5 in., \$1.55

Hot House, doz., \$0.65 85 1.20
Inch 1/4 1/2 3/4 1 1 1/2 2 3
Screw, doz., \$0.18 1/4 1/2 3/4 1 1 1/2 2 3
Inch 1/4 1/2 3/4 1 1 1/2 2 3
Side, doz., \$0.25 1/4 1/2 3/4 1 1 1/2 2 3
Inch 1/4 1/2 3/4 1 1 1/2 2 3
Stowell's:
Casting or End, Anti-Friction, 60¢ to 10¢
Dumb Waiter, Anti-Friction, 60¢ to 10¢
Electric Light 60¢
Side, Anti-Friction 60¢ to 10¢

Sash Pulleys—
Common Frame; Square or
Round End, per doz. 1 1/4 and
2 in. 10¢ to 19¢
Auger Mortise, no Face Plate,
per doz., 1 1/4 and 2 in. 17¢ to 19¢

Acme, No. 35, 1 1/4 in., 18 1/2¢; 2 in., 29 1/2¢
Box-all-steel, Nos. 3 and 1, 2 in. 50¢
Grand Rapids All Steel Noiseless..... 50¢
Ideal 70¢ to 5¢
Niagara, No. 25, 1 1/4 in., 18 1/2¢; 2
in., 29 1/2¢
No. 26, 1 1/4 in., 14 1/2¢; 2 in., 16 1/2¢
Star, No. 25, 1 1/4 in., 18 1/2¢; 2 in., 29 1/2¢
Tackle Blocks—See Blocks.

Pumps—
Castern 60¢
Pitcher Spout..... 75¢ to 75¢ 10¢
Wood Pumps, Tubing, &c. 45¢ to 50¢
Barnes Dbl. Acting (low list)..... 40¢ to 10¢
Barnes Pitcher Spout..... 75¢ to 10¢
Contractors' Rubber Diaphragm No.
2, B. & L. Block Co..... \$16.00
Daisy Spray Pump..... per doz. \$6.50
Flint & Walling's, Fast Mail Hand
(low list)..... 55¢
Flint & Walling's Fast Mail (low
list)..... 55¢
Flint & Walling's Tight Top Pitcher
75¢ to 10¢ 5¢
National Specialty Mfg. Co. Measur-
ing, Nos. 2, \$6.00; 3, \$5.50..... 30¢
Myers' Pumps (low list)..... 40¢ to 10¢
Myers' Power Pumps..... 40¢ to 10¢
Myers' Spray Pumps..... 40¢ to 10¢

Pump Leathers—
Plunger and Lower Valve—Per
gro.:
Inch... 8 8 1/4 2 1/2 3 1/2 3 3/4 4
Inch... \$2.20 2.50 2.75 3.00
Inch... \$3.30 3.60 3.85 4.10 4.40
Plunger Cup Leathers—Per 100:
Inch... 2 1/2 3 3 1/2 4
Inch... \$2.75 3.85 5.00 6.00

Punches—
Saddlers' or Drive, good.....
doz. 50¢ to 75¢
Spring, single tube, good qual-
ity \$1.75 to \$2.00
Revolving (1/4 tubes) doz. \$3.50 to \$3.75
Bemis & Call Co.'s Cast St'l Drive..... 50¢
Morrill's No. 1A, 1A, 1B, 1C
..... \$15.00
Hercules, 1 die, each \$5.00..... 50¢
Niagara Hollow Punches..... 50¢
Niagara Solid Punches..... 55¢ to 10¢
Wm. Schollhorn Co.:
Belt and Ticket, Bernard, 33 1/4%;
Paragon, 50%; Lodi..... 50¢
Tinnars' Hollow, P. S. & W. Co. 53 1/4%;
Tinnars' Solid, P. S. & W. Co. 53 1/4%;
Tinnars' Solid, P. S. & W. Co. 50%

Rail—Barn Door, &c.—
Sliding Door, Painted Iron..... 2 1/2 to 2 3/4

Sliding Door, Wrought Brass
1 1/2 in., lb., 36¢ 30¢
Atch. Mfg. Co.: Reliable Hanger
Track 50¢
Cronk's:
Double Braced Steel Rail, per ft. 3 1/4¢
O. N. T. Rail..... 3¢
Hinge Rail..... 30¢
Griffin's:
xxx, per 100 ft., 1 x 3-16 in., \$3.00;
1 x 3-16 in., 3.50;
Hinged Hanger, per 100 ft., 1 x 3-16
in., \$3.10; 1 1/4 x 3-16 in., \$3.80.
Lane's:
Hinged Track, per 100 ft., 1 in., \$3.40;
1 1/4 in., \$3.90.
O. N. T., per 100 ft., 1 in., \$3.00; 1 1/4
in., \$3.60; 1 1/2 in., \$4.00.
Standard, 1 1/4 in..... per 100 ft. \$4.00
Lawrence Bros.:
per 100 ft. No. 201, \$4.00; No. 202, \$4.00
New York, 1 x 3-16 in., per 100 ft. \$3.00
McIntyre's:
Hinged Hanger Rail, per ft., 1 1/4¢ 50¢
None Better..... per ft. 3 1/4¢
Standard per ft. 4¢
Myers' Stayon Track..... 60¢ to 10¢
Richards' Mfg. Co.:
Common, 1 x 3-4 in., \$3.00; 1 1/4 x
3-16, \$3.25; 1 1/2 x 3-16, \$3.50.
Special Hinged Hanger Rail..... 60¢ to 10¢
Lag Screw Rail, No. 65..... 50¢
Gauge Trolley Track, per ft. No. 31,
9¢; No. 32, 11¢; No. 33, 20¢.
No. 50..... 60¢ to 10¢
No. 61, \$3.00; 62, \$3.25; 63, \$3.50; 64,
\$4.00; 65, \$3.25; 66, \$3.50; 67, No. 1,
\$3.25; 68, No. 2, \$3.50.
Stowell's:
Cast Rail..... per ft. 2 1/4¢
Steel Rail, Plain..... 25¢
Wrought Bracket, 1 3-16 in..... per ft. 3¢
Wrought Bracket, 1 1/2 x 5-16, per ft. 1¢
Swett's Hylor, per ft. 1 1/4¢ 50¢
F. L. B. Steel Rail..... per 100 ft. \$3.00
No. 0, 1 x 3-16..... per 100 ft. \$3.00

Rakes—
NOTE.—Many goods are sold
at net prices.
Fort Madison Red Head Lawn..... \$3.25
Fort Madison Blue Head Lawn..... \$2.70
Jackson Lawn, 20 and 30 teeth, per
doz., net..... \$4.25
Cronk's:
New Champion Garden, per doz., 12
teeth, \$15.00; 14, \$16.50; 16, \$18.00..... 75¢
Victor Garden, per doz., 12 teeth,
\$15.00; 14, \$16.50; 16, \$18.00..... 80¢
Queen City Lawn, per doz., 20 teeth,
\$2.25; 21, \$3.00..... net
Aurora Lawn, per doz..... net
Malleable Garden..... 70¢ to 10¢
Ideal Steel Garden, per doz., 12 teeth,
\$15.00; 14, \$16.00; 16, \$18.00..... 80¢
Kohler's:
Lawn Queen, 20-teeth..... per doz. \$2.90
Lawn Queen, 24-teeth..... per doz. \$3.00
Paragon, 20-teeth..... per doz. \$2.70
Paragon, 24-teeth..... per doz. \$2.75
Steel Garden, 14-teeth..... per doz. \$2.40
Malleable Garden, 14-teeth, per doz.,
\$1.75 to \$2.00

Raps, Horse—
Disston's 75¢
Heller Bros. 70¢ to 70¢ 10¢ 5¢
Liverlight Bros.' Gold Medal 70¢ to 10¢ 75¢
New Nicholson 70¢ to 10¢ 75¢
See also Files.

Razors—
Ivana, Ro-ma-ic..... 60¢
Ivana Razors, per doz., No. 42, \$10.00;
No. 44, \$20.00; No. 42, Platina } 10¢
\$25.00

Red Devil..... 50%
Silberstein:
Carbo Magnetic, \$21.00; Griffin No.
65, \$13.50; Griffin, No. 60, \$12.00;
all other Razors, 40%.

Safety Razors—
Kampfe Bros.:
Star Safety, 25%; Star Interchange-
able, 25%; Star Safety Corn, 25%
Silberstein 40%

Reels, Fishing—
Hendryx:
M 6, Q 6, A 6, B 6, M 9 1/4, M 16,
Q 16, A 16, B 16, 4008, Rubber,
Populo, Nickeled Populo..... 20¢
Aluminum German Alloy, Bronze..... 25¢
1240 N, 124 N..... 20¢
304 N, 304 N, 6 R.M. G 9..... 25¢
4 N, 6 P.N. 24 N, 26 P.N..... 20¢
2904 P, 33 1/4; 2904 P.N., 33 1/4; 9024 N,
33 1/4; 9204 N, 33 1/4; 92904 P.N.,
33 1/4; 902 N, 33 1/4; 92904 P.N.,
33 1/4
966 P.N., 2904 N, 974 P.N..... 25¢
5009 P.N., 5009 N..... 20¢
Competitor, 102 P, 102 P.N., 202 P,
202 P.N., 102 P.R., 202 P.R..... 20¢
304 P, 304 P.N., 03034 P, 03034 P.N. 33 1/4

Registers—List July 1, 1903.
Japanned, Electroplated and
Bronzed 66 2/3 to 66 2/3 10¢
White Porcelain Enamel..... 60¢
Solid Brass or Bronze Metal,
40¢ to 10%

Revolvers—
Single Action..... 95¢ to \$1.00
Double Action, except 4 1/2 cal. \$1.80
Double Action, 4 1/2 cal..... \$2.00
Automatic \$3.50
Hammerless \$3.00

Riddles, Hardware Grade
16 in..... per doz. \$2.50 to \$2.75
17 in..... per doz. \$2.75 to \$3.00
18 in..... per doz. \$3.00 to \$3.25

Rings and Ringers—
Bull Rings—
Steel \$0.70 0.75 0.80 doz.
Copper \$1.15 1.35 1.75 doz.
Kea's Improved Self-Piercing, per doz.,
Copper, 2 in., \$1.25; 2 1/2 in., \$1.50;
3 in., \$1.75.

Hog Rings and Ringers—
Hill's Rings, gro. boxes, \$1.00 to \$1.50
Hill's Ringers, Gray Iron.....
doz. 50¢ to 55¢

Hill's Ringers, Malleable Iron.....
doz. 70¢ to 75¢

Blair's Rings..... per doz. \$4.75 to \$5.25
Blair's Ringers, per doz. \$0.60 to .63
Brown's Rings, per doz. \$5.00 to \$5.50
Brown's Ringers, per doz. \$0.60 to .63

Rivets and Burrs—
Copper 33 1/3 to 35¢
Carriage, Coopers, Tinnars, &c.:
Black 70¢ to 10¢
Metallic Tinned..... 70¢
Bifurcated and Tubular—
Assorted in Boxes.
Bifurcated, per doz. boxes, paste-
board boxes, 23¢ to 25¢; Tin boxes,
29¢ to 35¢.
Tubular, per doz. boxes, 50 count,
12¢; 100 count, 51¢ to 58¢.

Rollers—
Acme, Stowell's Anti-Friction..... 50¢
Cronk's Stay No. 65, \$0.90; No.
50 \$1.00
Cronk's Brinkerhoff No. 55, \$0.60;
No. 56 \$0.94
Cronk's Stay..... 40¢
Richards' Stay:
Handy Adj. and Reversible No. 23, 75¢
O. K. Adj. and Reversible No. 56, 50¢
Lag Screw, Nos. 55 and 57..... 50¢
Underwriters, Nos. 59, 60..... 50¢
Favorite, No. 54..... 50¢
Stowell's Barn Door Stay, per doz. \$1.00
Stowell's Anti-Friction..... 50¢
Screw and Spike Stay..... per doz. 60¢
Hinge Adjustable Stay..... per doz. 90¢

Rope—
Manila, 7-16 in. diam. and larger:
Pure lb., 13¢ to 13 1/2¢
Sisal, 7-16 in. diam. and larger:
Pure lb., 9 1/2¢
Sisal, 7-16 in. diam. and larger:
No. 2 quality lb., 7 1/2¢ to 8¢
Sisal, Hay, Hide and Buie
Ropes, Medium and Coarse:
Mixed lb., 7 1/2¢ to 8¢
Pure lb., 9 1/4¢
Sisal, Tarred, Medium Lath
Yarn, Coarse and Untarred:
Mixed lb., 7 1/2¢ to 8¢
Pure lb., 8¢
Cotton Rope:
Best, 1/4 in. and larger..... 17¢ to 18¢
Medium, 1/4 in. and larger..... 16 1/2¢ to 17¢
Common, 1/4 in. and larger..... 16¢
In coils, 1/4 advance.

Wire Rope—
Galvanized 37 1/4 to 40 1/4¢
Plain 15¢ to 2 1/2¢

Ropes, Hammock—
Covert Mfg. Co.:
Jute, 35%; Sisal..... 20%

Rules
Bowwood 60¢ to 60¢ 10¢
Ivory 35¢ to 10¢ 35¢ to 10¢ 5¢
Chapin-Stephens Co.:
Boxwood 60¢
Flexiflow 40¢
Ivory 60¢ to 60¢ 10¢
Miscellaneous 50¢ to 55¢ 10¢
Stathens' Combination..... 50¢
Stationers' 10%

Keuffel & Esser Co.:	36.40%
Folding, Wood.....	33.40%
Folding, Steel.....	33.40%
Luffkin's Steel.....	50.40%
Luffkin's Lumber.....	50.40%
Stanley R. & L. Co.:	50.40%
Boxwood.....	50.40%
Ivory.....	50.40%
Miscellaneous.....	50.40%
Zig Zag.....	50.40%
Zig Zag, Pin Joint.....	50.40%
Upon Nut Co.:	50.40%
Boxwood.....	50.40%
Ivory.....	50.40%

Sash Balances—

See Balance, Sash.

Sash Locks—

See Locks, Sash.

Sash Weights—

See Weights, Sash.

Sausage Stuffers or Fillers

See Stuffers or Fillers, Sausage.

Saw Frames—

See Frames, Saw.

Saw Sets—See Sets, Saw.**Saw Tools—See Tools, Saw.****Saws—**

Atkins:	45%
Circular.....	50.40%
Hand.....	50.40%
Butcher Saws.....	50.40%
Cross Cut.....	50.40%
One-Man Cross Cut.....	50.40%
Narrow Cross Cut.....	50.40%
Hand, Rip and Panel.....	50.40%
Miter Box and Compass.....	50.40%
Mulay, Mill and Drag.....	50.40%
Chapin-Stephens Co.:	50.40%
Turning Saws and Frames.....	50.40%
Diamond Saw & Stamping Works:	50.40%
Sterling Kitchen Saws.....	50.40%
Diston's:	50.40%
Circular, Solid and Ins'ted Tooth.....	50.40%
Hand, 2 to 18 in. wide.....	50.40%
Hand, 1/4 to 1 1/2.....	50.40%
Crosscut.....	50.40%
Narrow Crosscut.....	50.40%
Mulay, Mill and Drag.....	50.40%
Framed Woodsaws.....	50.40%
Woodsaw Rods, Tinned.....	50.40%
Woodsaw Blades.....	50.40%
Hand Saws, Nos. 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, 94, 96, 98, 100.....	50.40%
Combination.....	50.40%
Compass, Key Hole, &c.....	50.40%
Butcher Saws and Blades.....	50.40%

C. E. Jennings & Co.'s:	50.40%
Back Saws.....	50.40%
Butcher Saws.....	50.40%
Compass and Key Hole Saws.....	50.40%
Framed Wood Saws.....	50.40%
Hand Saws.....	50.40%
Wood Saw Blades.....	50.40%
Millers Falls:	50.40%
Butcher Saws.....	50.40%
Star Saw Blades.....	50.40%
Mammoth Saw Works:	50.40%
Victor Kitchen Saws.....	50.40%
Butcher Saws.....	50.40%
Peace & Richardson's Hand Saws.....	50.40%
Simonds:	50.40%
Circular Saws.....	50.40%
Crecent Ground Cross Cut Saws.....	50.40%
One-Man Cross Cut.....	50.40%
Gang Mill, Mulay and Drag Saws.....	50.40%
Hand Saws.....	50.40%
Back Saws.....	50.40%
Butcher Saws.....	50.40%
Hand Saws.....	50.40%
Hand Saws, Bay State Brand.....	50.40%
Compass, Key Hole, &c.....	50.40%
Wood Saws.....	50.40%
Wheeler, Madden & Clemens Mfg. Co.'s Cross Cut Saws.....	50.40%

Atkins' Hack Saw Blades A & A.....	50.40%
Diston's:	50.40%
Concave Blades.....	50.40%
Keystone Blades.....	50.40%
Hack Saw Frames.....	50.40%
Simonds File Co.:	50.40%
C. E. Jennings & Co.'s:	50.40%
Hack Saw Frames, Nos. 175, 180.....	50.40%
Hack Saws, Nos. 175, 180, complete.....	50.40%
Goodell's Hack Saw Blades.....	50.40%
Griffin's Hack Saw Frames.....	50.40%
Griffin's Hack Saw Blades.....	50.40%
Star Hack Saws and Blades.....	50.40%
Sterling Hack Saw Blades.....	50.40%
Sterling Hack Saw Frames.....	50.40%
Sterling Power Hack Saw Machines.....	50.40%
each, No. 1, \$25.00; No. 2, \$30.00.....	50.40%
Victor Hack Saw Blades.....	50.40%
Victor Hack Saw Frames.....	50.40%

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Sterling Power Hack Saw Machines.....	50.40%
each, No. 1, \$25.00; No. 2, \$30.00.....	50.40%
Victor Hack Saw Blades.....	50.40%
Victor Hack Saw Frames.....	50.40%

Adjustable Box Scraper (S. R. & L. Co.), \$4.00.....	45%
Chapin-Stephens Co., Box.....	30.40%

Screws—Bench and Hand

Bench, Iron, doz., 1 in., \$2.50.....	50.40%
2 1/2; 1 1/2, \$3.00; 3 1/2; 1 1/2, \$3.50.....	50.40%
Bench, Wood.....	20.40%
Hand, Wood.....	20.40%
R. Bliss Mfg. Co., Hand.....	20.40%
Chapin-Stephens Co., Hand.....	20.40%
Coach, Lag and Hand Rail.....	20.40%
Lag, Cone Point, list Oct. 1.....	75.40%
Oct. 1, '90.....	75.40%
Hand Rail, list Jan. 1, '91.....	75.40%

Jack Screws—

Standard List.....	75%
Millers Falls.....	50.40%
P. S. & W.....	50.40%
Swett Iron Works.....	75.40%

Machine—

List Jan. 1, '91.....	50.40%
Flat or Round Head, Iron.....	50.40%
Flat or Round Head, Brass.....	50.40%

Set and Cap—

Set (Iron).....	75.40%
Set (Steel), net advance over Iron.....	25%
Sq. Hd. Cap.....	70.40%
Hex. Hd. Cap.....	70.40%
Rd. Hd. Cap.....	60.40%
Fillister Hd. Cap.....	60.40%

Wood—

List July 23, 1903.....	50.40%
Flat Head, Iron.....	50.40%
Round Head, Iron.....	50.40%
Flat Head, Brass.....	50.40%
Round Head, Brass.....	50.40%
Flat Head, Bronze.....	75.40%
Round Head, Bronze.....	75.40%
Drive Screws.....	50.40%

Scroll Saws—

See Saws, Scroll.....	50.40%
Scythes— Per doz.....	50.40%
Grass, No. 1, Plain.....	\$6.25 @ \$6.75
Clipper, Bronzed Webb.....	\$6.50 @ \$7.00
No. 3 Clipper, Pol'd Webb.....	\$6.75 @ \$7.25
No. 6 Clipper and Solid Steel.....	\$7.00 @ \$7.50
Bush, Weed and Bramble, No. 2.....	\$6.50 @ \$7.00
Grain, No. 1.....	\$8.25 @ \$8.75
Bronzed Webb, No. 1.....	\$8.50 @ \$9.00
Nos. 3 and 4 Clipper, Grain.....	\$8.75 @ \$9.25
Solid Steel, No. 6.....	\$9.25 @ \$9.75

Seeders, Raisin—

Enterprise.....	25.40%
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Sets—Awl and Tool—

Fray's Adj. Tool Handles, Nos. 1, \$12; 2, \$15; 3, \$18; 4, \$21; 5, \$24.....	50.40%
C. E. Jennings & Co.'s Model Tool Holders.....	30%
Millers Falls Adj. Tool Handles, No. 1, \$12; No. 4, \$12; No. 5, \$15.....	50.40%

Garden Tool Sets—

Ft. Madison Three Flows, Hoe, Rake and Shovel.....	per doz sets \$9.00
Octagon.....	per doz \$3.50 @ \$3.75
Buck Bros.....	40.40%
Cannon's Diamond Point.....	per doz \$12.40 @ \$13.40
Mayhew's.....	per doz \$9.50 @ \$10.50
Snell's Corrugated, Cup Pt.....	40.40%
Snell's Knurled, Cup Pt.....	40.40%
Victor Knurled Cup Pt.....	per doz \$7.50

Rivet—

Regular list.....	75.40%
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Saw—

Atkins:	45%
Criterion.....	40%
Adjustable.....	40%
Diston's Star, Monarch and Triumph.....	30%
Morrill's No. 1.....	\$15.00
Nos. 3 and 4, Cross Cut.....	\$20.00
No. 5, Mill.....	\$30.00
Nos. 10, 11, 12.....	\$15.00
No. 1 Old Style.....	\$10.00
Special.....	\$12.25
Giant Royal Cross Cut.....	per doz \$8.00
Royal, Hand.....	per doz \$4.00
Taintor Positive.....	per doz \$4.75

Shaving—

Fox Shaving Sets, No. 30.....	per doz, net, \$24.00
Smith & Hemenway Co.'s.....	60%

Sharpeners, Knife—

Pike Mfg. Co.:	70%
Fast Cut Pocket Knife Hones.....	per doz \$1.50
Mounted Kitchen Sand Stone.....	per doz \$1.50
Natural Grit Carving Knife.....	per doz \$3.00
Hones, per doz.....	\$3.00
Quick Cut Emery Carving Knife Hones, per doz.....	\$1.50
Quick Edge Pocket Knife Hones, per doz.....	\$2.50

Skate—

Smith & Hemenway Co., Eureka.....	20%
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Shaves, Spoke—

Iron.....	per doz \$1.10 @ \$1.25
Wood.....	per doz \$1.75 @ \$2.25
Rail's (Stanley R. & L. Co.).....	45%
Razor Edge (Stanley R. & L. Co.).....	55%
Iron, 50%: Wood.....	55%
Chapin-Stephens Co.....	30.40%
Goodell's.....	per doz \$9.00 @ \$10.00
Wood's F1 and F2.....	50%

Shears—

Cast Iron.....	7- 8 9 in.</
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CURRENT METAL PRICES.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

IRON AND STEEL—			Galvanized.		Sheet Copper Hot Rolled, 16 oz.	
Bar Iron from store—					14	
Refined Iron:			Nos. 14 to 16.	per lb.	3.35¢	per lb. 32@34¢
1 to 1½ in. round and square.	per lb.	2.20¢	Nos. 22 to 24.	per lb.	3.15¢	33@36¢
1½ to 4 in. x ½ to 1 in.	per lb.	2.40¢	No. 27.	per lb.	4.30¢	
1½ to 5 in. x ½ to 1 in.	per lb.	2.40¢	No. 28.	per lb.	4.45¢	
Rods—¾ and 1½ round and square.	per lb.	2.40¢	No. 20 and lighter 36 inches wide, 25¢ higher.			
Angles:	per lb.	2.40¢	Tin Plates—			
8 in. x ¼ in. and larger.	per lb.	2.40¢	American Charcoal Plates (per box.)			
(except 3½ in. and 4 x ¼ 2.50¢)	per lb.	2.40¢	A.A.A. Charcoal:			
8 in. x 3-16 in. and ¼ in.	per lb.	2.65¢	IC, 14 x 20.			
1½ to 2½ in. x ½ in.	per lb.	2.45¢	IX, 14 x 20.			
1½ to 3½ in. x 3-16 in. and thicker.	per lb.	2.45¢	A. Charcoal:			
1 to 1¼ in. x 3-16 in.	per lb.	2.45¢	IC, 14 x 20.			
1 to 1½ x ½ in.	per lb.	2.50¢	IX, 14 x 20.			
¾ x ¾ in.	per lb.	2.65¢				
¾ x ¾ in.	per lb.	2.75¢				
¾ x ¾ in.	per lb.	3.80¢				
¾ x ¾ in.	per lb.	4.30¢				
Tees:	per lb.	2.75¢	American Coke Plates—Bessemer—			
1 in.	per lb.	2.55¢	IC, 14 x 20.			
1½ in.	per lb.	2.55¢	IX, 14 x 20.			
1½ to 2½ in.	per lb.	2.50¢				
3 in. and larger.	per lb.	2.40¢	American Terne Plates—			
Beams—1½ to 6 x 3-16 to No. 8.	per lb.	2.40¢	IC, 20 x 25 with an 8 lb. coating.			
Channels, 3 in. and larger.	per lb.	2.40¢	IX, 20 x 25 with an 8 lb. coating.			
Burden's Best "Iron, base price.	per lb.	3.05¢				
Burden's "H. B. & S." Iron, base price.	per lb.	3.05¢	Seamless Brass Tubes—			
"Ulster"	per lb.	3.10¢	List December 4, 1905.			
Norway Bars.	per lb.	3.60¢	Base price 27¢.			
Norway Shapes.	per lb.	3.80¢	Brass Tubes, Iron Pipe Sizes—			
Merchant Steel from Store—			List December 4, 1905.			
per lb.			Base price 27¢			
Bessemer Machinery.	per lb.	2.10¢	Copper Tubes—			
Toe Calk, Tire and Sleigh Shoe.	per lb.	2.50¢	List December 4, 1905.			
Best Cast Steel, base price in small lots.	per lb.	7¢	Base price 33¢			
Sheets from Store—			Braze Brass and Bronze Tubes—			
Black			List June 6, 1898.			
One Pass, C.R.			Add to List 5¢ to 9¢			
Soft Steel.			High Brass Rods—			
Cleaned.			Add to List 1¢ to 2¢			
No. 14.	per lb.	2.05¢	Roll and Sheet Brass—			
Nos. 18 to 21.	per lb.	3.10¢	List June 6, 1898.			
No. 27.	per lb.	3.20¢	Add to List 3¢ to 5¢			
No. 28.	per lb.	3.30¢	METALS—			
Russia, Planished, &c.			Tin—			
Genuine Russia, according to assort-			Straits Pig.			
ment.			Lake Ingot.			
Pa. ent planished.			Electrolytic.			
			Casting.			
			Straits Pig.			
			Lake Ingot.			
			Electrolytic.			
			Casting.			

THE IRON AGE

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